

PN. ABU-859
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SUSTAIN

**WORKSHOP:
AGROINDUSTRIAL MARKETS**

SEPTEMBER 5 - 15, 1994

ZAMBIA

Sharing
United
States
Technology to
Aid in the
Improvement of
Nutrition

A U.S. Private Food Industry initiative
in collaboration with the U.S. Agency for International Development
through a Cooperative Agreement with the National Cooperative Business Association

Upgrading the Food Processing Industries in Developing Countries.

Why SUSTAIN?

SUSTAIN represents a successful collaborative effort between the U.S. food industry and the Agency for International Development (A.I.D.) to upgrade food processing in developing countries. It provides an excellent model for similar private-public sector joint ventures in health, agriculture and other areas of concern to developing countries.

Food processing is a major contributor to development. It serves multiple roles. Food processing can increase the available food supply by extending the life of perishable food products. It can improve the nutritional quality of the diet by making nutritious foods available the year round. It can lead to the growth of related enterprises in transportation, storage, distribution and marketing. And, it can produce much needed foreign exchange by creating value added products both for export and for internal substitution of imported processed foods.

The U.S. food industry has embraced the concept that freely sharing its expertise and knowledge is of mutual benefit to recipient and donor - to the recipient by improving current operations - to the donor by contributing to a healthier global future.

How SUSTAIN Works

A.I.D. missions and trade associations in developing countries publicize SUSTAIN's goals and activities. Executives of U.S. food companies with technical expertise and overall knowledge of the food industry serve as the SUSTAIN Steering Committee, providing guidance and overseeing activities.

Food related companies in developing countries submit their requests to SUSTAIN through the A.I.D. mission or a designated organization in their country. SUSTAIN screens all incoming requests and if necessary asks for additional information. Appropriate U.S. companies are then invited to respond.

Some problems can be readily resolved by providing information. Others require that consultants be sent. When a consultant is sent, the usual assignment is for one to three weeks. Upon completion of the assignment, the consultant prepares a report describing findings and making recommendations. Depending on need, some consultants may return for follow-up visits to ensure that recommendations have been appropriately implemented.

SUSTAIN Helps

Requests are diverse. Help may be needed to solve processing problems, to identify equipment needs and sources of new and used equipment, to train personnel in the use of new equipment and new technologies, to find new uses for indigenous commodities, to establish or improve quality assurance procedures, to control insects and rodents in food processing plants and to improve plant layouts and materials handling.

In the past, U.S. food companies, large and small, have provided technical assistance in the form of information, consultants and training to food processors in Africa, Asia, Latin American and the Caribbean.

SUSTAIN

USAID/USDA/SUSTAIN

WORKSHOP: AgroIndustrial Markets

Zambia

September 5 - 15, 1994

Sponsored by:

U.S. Agency for International Development

in collaboration with

U.S. Department of Agriculture and SUSTAIN

Report Prepared by SUSTAIN Volunteers:

**Bruce Gaylord, Project Manager
Autumn Harp, Inc.**

**Donald Lindemann, Senior Packaging Engineer
Land O'Lakes, Inc.**

**John Nelson, Vice President-Science & Technology (Retired)
McCormick & Company, Inc.**

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NCBA/SUSTAIN Project 111.049

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I. INTRODUCTION

A. SUSTAIN

Sharing U.S. Technology to Aid in the Improvement of Nutrition (SUSTAIN) provides access to U.S. expertise in food processing to help improve the nutritional quality, safety, and availability of food in developing countries. Technical assistance is provided by volunteer professionals from U.S. food companies, universities, and other organizations who donate their time and expertise. In 1991, the Office of Nutrition of U.S. Agency for International Development (USAID) awarded the National Cooperative Business Association a five-year cooperative agreement to work with SUSTAIN's volunteer leadership to improve, expand, and manage the program.

The assistance SUSTAIN volunteers provide contributes to improved health and nutrition through improved food quality, safety, and availability. In many countries, sufficient food is produced but populations are underserved because much of it goes to waste due to inefficient processing and storage. Improper food handling presents a hazard to human health, and improper waste disposal can contribute to environmental degradation. Providing technical assistance to strengthen food safety and quality helps prevent health and nutrition problems and helps small businesses compete in local, national, and regional markets.

B. Agroindustrial Markets Workshop

At the request of Jerry Brown, USAID/Africa Bureau, SUSTAIN provided three experts for the Agroindustrial Markets Workshop in Zambia. SUSTAIN volunteers, Bruce Gaylord (Project Manager, Autumn Harp, Inc.), Donald Lindemann (Senior Packaging Engineer, Land O'Lakes, Inc.), and John Nelson (Vice President-Science & Technology (Retired) McCormick & Company, Inc.) delivered presentations on natural ingredients, packaging, and spices, oleoresins, and essential oils.

The workshop was sponsored by USAID/Africa Bureau and the International Cooperation and Development (ICD/FAS) division of the Foreign Agriculture Service of the U.S. Department of Agriculture (USDA). Thirty-one small, micro, and small agribusiness people of southern Africa participated. It was held in Lusaka, Zambia from September 5 - 15, 1994. The objective of the workshop was to provide a forum to analyze and develop market strategies for four commodity subsectors which included natural food ingredients; essential oils, oleoresins, and spices; medicinal herbs; and processed staple crops (maize, legumes, and oilseeds).

The workshop provided training in business skills, food technologies, and market development. After the workshop, Bruce Gaylord provided one-on-one technical assistance to a rural bee cooperative that sells beeswax as an ingredient for the cosmetics industry.

As a result of this workshop, participants formed a herbs, spice, and essential oils association, which has enabled interaction and exchange of information; attended a regional workshop in Zimbabwe; introduced new commercial crops; worked with the Department of Forestry to identify medicinal plants; and organized a regional farmers exchange program. USAID/Africa Bureau is in the process of organizing future training workshops in business development and food and agriculture technologies to follow-up on this workshop.

II. Reports by SUSTAIN Volunteers

A. Report by SUSTAIN Volunteer Bruce Gaylord

REPORT ON AGROINDUSTRIAL MARKETS WORKSHOP LUSAKA, SEPTEMBER 5-15, 1994

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SECTION ONE: OBJECTIVES, GOALS, METHOD, WORKSHOP OUTLINE, PARTICIPANTS AND RESOURCE PEOPLE

1.1 Objectives

To introduce a subsector approach to market planning and analysis to micro, small and medium size entrepreneurs; to identify and access regional technology transfer resources; to analyze potential impact of regional marketing strategies on inter-regional and extra-regional markets.

1.2 Goals

To provide a forum to analyze and develop market strategies for four commodity subsectors: natural food ingredients, essential oils, oleoresin and spices, medicinal herbs and processed staple crops.

1.3 Method

The commodity systems planning and analysis approach is the primary methodology identified to assist workshop participants to learn about: the U.S. and European natural ingredients markets, regional processed staple food crop markets and regional market strategies for targeted products.

1.4 Workshop outline

See Appendix A

1.5 Workshop participants and resource people

See Appendix B

SECTION TWO: MY PARTICIPATION

2.1 My experience

Autumn Harp is a manufacturer of both branded and private label "natural" skin care products. As a member of the management team (sales manager, production manager and new product manager), I've participated in the planning and implementation of business plans that enabled us to grow from gross sales of \$200,000 in 1987 to \$5,000,000 in 1994. Honey Stick lip balm, one of the products we manufacture for The Body Shop, utilizes beeswax and honey from the Southern African country of Zambia. I have seven years of hands-on experience growing a small company and an understanding of the natural ingredients market and the mechanics required to bring these ingredients to Autumn Harp from Southern Africa. This is the experience and knowledge I brought to the workshop to contribute toward the achievement of the goals and objectives through the presentation of case studies, round table discussions, individual consultations and field trips to local businesses.

2.2 Honey Stick case study

See Appendix C

2.3 Financial Services Institutions for Micro and Small Businesses: Doing the deal

See Appendix C

SECTION THREE: NORTH WESTERN BEE PRODUCTS TRIP

3.1 Trip report

See Appendix D

SECTION THREE: OBSERVATIONS/CONCLUSIONS

4.1 Observations/conclusions

There was an equal number of men and women participants at the workshop with backgrounds ranging from professional seminar attenders and "wanta-be" entrepreneurs and successful owners of micro, small and medium businesses.

The workshop was well directed and organized by Jerry Brown and Freeman Daniels.

The resource group offered an interesting and worthwhile cross-section of large and small business experience and knowledge.

The presentations were well received, but I found the one-on-one and small group discussions with participants between and after sessions most valuable. I believe there should be more opportunities; the participants liked the idea of organized lunches, for small group discussions.

I found the lack of access to information needed to make informed business decisions a major block to launching new businesses in Zambia. Therefore, I promoted forming associations to gather and make available market, cost/price and research information. Many of the workshop participants got together after the awards ceremony and agreed on a timetable for the formation of a Southern Africa Business Association.

Overall, there are tremendous hurdles facing anyone attempting to start a regional or export business in Zambia including the cost of transportation from a land-locked country, finding financing, access to information needed to write a successful business plan and a lack of consumers. But I think there is opportunity for someone who is well organized, energetic and is willing to start small and gain experience from selling in the Zambian marketplace before growing beyond its borders.

North Western Bee Products is a company managed by Bob Malichi, a Zambian, and advised by Ben Robertson, an Oxfam employee. Both work effectively to identify ways to generate income in the remote areas of Zambia. Together, they've successfully revived the traditional activity of beekeeping, have started a pilot cooking oil production project, and have identified several other opportunities.

SECTION FIVE: PUBLIC RELATIONS

5.1 PR releases

See Appendix E

APPENDIX A

AGROINDUSTRIAL MARKETS WORKSHOP

September 5 - 15, 1994

Lusaka Zambia

Sponsored by
US Agency for International Development
in collaboration with
US Department of Agriculture

GOAL

To provide a forum to analyze and develop market strategies for four commodity subsectors

- Natural food ingredients
- Essential oils, oleoresin and spices
- Medicinal herbs
- Processed staple crops (maize, legumes and oilseeds)

WELCOME TO ZAMBIA

Monday, September 5, 1994

- 0830 Welcoming Remarks**
Freeman Daniels, Private Sector, Training Officer, African Bureau, USAID
Rudolph Thomas, Deputy Director, USAID / Zambia
Dr R Shimaponda, Deputy Minister, Ministry of Commerce and Industry
- 0900 Presentations and Discussions**
Dr Guy Scott, former Minister of Agriculture
Importance of the Agroindustrial Sector to the African Economy

Betty Wilkinson, Private Sector Advisor, USAID / Zambia
US and Support for Agroindustrial Development in Zambia
- 1030 Break** **Invited Guests are free to leave**
- 1100 Workshop Overview**
Facilitator : Jerry Brown, Agribusiness Advisor, African Bureau, USAID
- 1200 Participants' Expectations**
Facilitator : Jerry Brown, Agribusiness Advisor, African Bureau, USAID
- 1230 Lunch**
- 1400 Problem Identification**
Facilitator : Jerry Brown, Agribusiness Advisor, African Bureau, USAID

Demand and Utilization of Essential Oils, Natural Food Ingredients and Processed Staple Crops on Regional and Extra-Regional Markets

Tools to Assist Small Businesses to Plan and Manage their Commodities on the Marketplace
- 1500 Strategic Planning**
Facilitator : Dr Frank Fender, Director Food Industries Division Foreign Agriculture Service / ICD US Department of Agriculture
- 1630 Daily Wrap Up**
- 1930-2130 Evening Reception**

Tuesday, September 6, 1994

- 0830 Participant's Presentation**
Catherine Mwanamwambwa, Bimzi Ltd
Case Study : Marketing Successes and Failures (essential oils)
- 0900 Commodity Systems Approach (Production)**
Facilitator : Jerry Brown, Agribusiness Advisor, African Bureau, USAID
- 1000 Understanding Your Market : Information and Strategies**
Facilitator : Dr Frank Fender, US Department of Agriculture
- 1030 Break**
- 1100 Business Plan**
Facilitator : Jerry Brown, Agribusiness Advisor, African Bureau, USAID

- 1230 Lunch**
- 1400 Business Plan**
- 1530 Break**
- 1600 Prep for Field Trip**
- 1630 Daily Wrap Up**

Wednesday, September 7, 1994

- 0800 Technology Access : Visit to Africare .
Oil Ram Press**
- 1430 Participant's Presentation
Case Study : Marketing Successes and Failures (processed staple crops)**
- 1530 Commodity System : Technology Access, Dissemination and Resource
Identification
Facilitators :
Mark La Grange, Agricultural Marketing Specialist, Zambia Agricultural
Marketing Support Project
Carl Shoup, VOCA
Andrew Fletcher, Agriculture Commodity Exchange**
- 1530 Problem Identification : Demand and Utilization of Essential Oils, Natural
Ingredients and Staple Crops on Regional and Extra-Regional Markets
(continued from day #1)
Facilitators :
Bruce Gaylord, Autumn Harp
TBA - local resource person**
- 1630 Daily Wrap Up
Preparation for Field Trip**

Thursday, September 8, 1994

- 0800 Field Trip** Nshima Ltd
Msitu (herbs)
Willa Findlay Farm

Friday, September 9, 1994

- 0830 Participant's Presentation
Northwest Honey Cooperative, Zambia
Case Study : Marketing Successes and Failures (natural ingredients)**
- 0930 Outlook : Description of Market Requirements and Demand Trends for
Natural Ingredients Products
Facilitators :
Rob McCaleb, Herb Research Foundation
Bruce Gaylord, Autumn Harp**

- 1030 Break**
- 1100 Non Governmental Organizations : Technology Transfer and Business Development Assistance**
Facilitator : John Nelson, McCormick & Company
- 1230 Lunch**
- 1400 NGOs (continued)**
- 1500 Regional Support : Access to Seed Technology and Post Harvest Technologies including Transformation, Processing and Marketing (staple crops)**
Facilitators : :
Mark La Grange, Agricultural Marketing Specialist, Zambian Agricultural Marketing Support Project
Andrew Fletcher, Agriculture Commodity Exchange
Dr Vermer Bhola, Seed Breeder
Caleb A Mulenga, Chongeange Company Ltd
- 1630 Staple Commodities : Trends in Packaging and Security of Processed Staple Products**
Facilitator : Don Lindemann, Land O'Lakes
- 1730 Daily Wrap Up**

Saturday, September 10, 1994

Networking and Individual Market Strategies Discussions

Sunday, September 11, 1994

Free Day

Monday, September 12, 1994

- 0830 Participant's Presentation : Marketing Strategies and Issues (medicinal herbs)**
Participant : Madagascar
- 0930 Outlook : Description of Market Requirements and Demand Trends for Medicinal Herbs**
Facilitator : Rob McCaleb, Herb Research Foundation
- 1030 Break**
- 1100 Packing for Success : Packing Requirements and Standard for Non-Perishables**
Facilitator : Don Lindemann, Land O'Lakes
- 1230 Business Luncheon : Meeting Zambia's Agribusiness Community**

- 1400 Outlook : Description of Market Requirements and Demand Trends for Essential Oils, Oleoresins and Spices**
Facilitators :
Dr John Nelson, McCormick & Company
Rob McCaleb, Herb Research Foundation
Dr Siamwiza, National Council for Scientific Research
- 1530 Break**
- 1600 Extending the Formal and Informal Networks to Regional and Extra-Regional Markets**
Facilitators :
Norman Chipakupaku, Agriculture Cooperation
Freeman Daniels, Private Sector, Training Officer, African Bureau, USAID
- 1700 Daily Wrap Up**

Tuesday, September 13, 1994

- 0830 An Approach to Developing Regional Marketing Strategies**
Facilitator : John Nelson, McCormick & Company
- 1230 Lunch**
- 1400 Financial Services Institutions for Micro and Small Businesses : Doing the Deal**
Facilitators :
Bondie Gambrell, Forty Acres
Bruce Gaylord, Autumn Harp
- 1700 Daily Wrap Up**

Wednesday, September 14, 1994

- 0830 Quality Control and Quality Management : A Systematic Approach**
Facilitators :
Rob McCaleb, Herb Research Foundation
John Nelson, McCormick & Company
- 1000 Medicinal Herbs : Existing & New Markets for Medicinal Plants**
How to Establish and Maintain a Vibrant Medicinal Herb Sector
Facilitators :
Dr James Duke, USDA, Agriculture Research Service
Rob McCaleb, Herb Research Foundation
- 1030 Regional Marketing : Demand & Distribution Channels (staple crops)**
Facilitators :
Mark La Grange, Agricultural Marketing Specialist, Zambian Agricultural Marketing Support Project
Nigel Nicholson, Foods Botswana
- 1500 Your Business and Your Commodity : A Marriage Made in Heaven or Hell?**
Facilitators :
Bruce Gaylord, Autumn Harp
Bondie Gambrell, Forty Acres

Thursday, September 15, 1994

- 0830 **Review of Market Strategies**
(Three groups will be selected to present strategies they have developed during the week)
- 1000 **Panel : Resource Persons to Wrap Up**
- 1030 **Evaluation**
- 1200 **Closing Ceremony : Luncheon**

Note

PROJECT SUSTAIN (Sharing United States Technology to Aid in the Improvement of Nutrition) has provided three US food industry expert volunteers to this workshop. They are:

- Bruce Gaylord, Project Manager, Autumn Harp
- Donald Lindemann, Senior Packaging Engineer, Land O'Lakes and
- John Nelson, Senior Vice President, Science and Technology, retired, McCormick and Company

SUSTAIN improves the safety, quality, and availability of food in developing countries by providing access to experts from US food companies and universities. These specialists in food processing and preservation volunteer to provide technical assistance and training to help small food businesses develop and expand.

AGROINDUSTRIAL MARKETS WORKSHOP : Lusaka, September 5 - 15, 1994
PARTICIPANTS

Participant's Name	Address	Communication Details	Business Profile
CHAKRAS Donald J	Trinidad Industries (Pvt) Ltd P O Box AY 60 Harare Zimbabwe	Tel : 263 4 486253 Fax : 47722 Telex : 24307 TRINAS ZW Telegrams : Trinissat	General Manager Polymers and oils
GOMA Yvonne	Comet Enterprises Limited P O Box 320153 Lusaka Zambia	Tel : 260 1 264621 Fax : 260 1 264621	Managing Director Mixed farming Crops, livestock horticulture
GUNDIDZA Mazuru	Aroma Chemicals (Pvt) Ltd 23 Mountbatten Drive P O Box MR 5. Mariborough Harare Zimbabwe	Tel : 263 4 300053 Fax : 263 4 333407	Managing Director Essential oils, drugs development and natural products production
GXOTIWE Temba Harry	Binfield Citrus Farm (Pty) Ltd P O Box 292 Fort Beaufort 5720 Eastern Cape RSA	Tel : 0404 31678 / 31684 / 31160 or 04634 31132 Fax : 04634 31387	Manager Citrus production for export Essential oils industries
HAWES Andile Maxwell	Ciskei Agricultural Corporation P O Box 292 Fort Beaufort 5720 Eastern Cape Province South Africa	Tel : 04634 31132 / 31187 or 0404 31582 Fax : 04634 31387	Senior Manager Citrus production for export
LUKWESA Mwamba	Ministry of Commerce, Trade and Industry P O Box 31968 Lusaka Zambia	Tel : 228301 ext 238	Economist (Industry) Desk Officer Small Scale Enterprise Development Women in Business
MANJORO Barbara	Manjoro Import and Export Limited Stand No 994 Machipisa Shopping Centre Highfield Harare Zimbabwe	Tel : 263 4 63276 / 67229	Director Marketing of essential oils, fragrances, flavours, medicinal oils, herbs herbal medicines and oils
MARTELLA David R	USAID/REDSO/S/SAJANR Nairobi Kenya		Agricultural Economist / Advisor
MATHEWS Evan D	African Farmers Union P O Box 16374 Vlaeberg 8018 South Africa	Tel : 0236 40006 021 4182848/9 Fax : 021 4197034 0236 400068	Chairperson
McLEAN Ian	Organic Herb Farms(Pty) Ltd P O Box 4336 Cape Town 8001 South Africa	Tel : 00 27 21 419 1720 Fax : 00 27 21 419 0789	Manager Organic Herbs for local and export, indigenous and non-indigenous

Participant's Name	Address	Communication Details	Business
MTOLO Reuben	Eastern Cooperative Union Limited P O Box 510108 Chipata Zambia	Tel : 062 22311-4 / 22298 / 22468 Fax : 062 22468 Telex : 63200	Deputy General Manager Agro milling : maize, wheat, cooking oil, meal flour, rice, stockfeed, groundnut exports Transport General Trade Poultry hatchery Guest houses
MUKUBEKUBE Shadreck	Bimzi Limited P O Box 50514 Lusaka Zambia Mukwa Road, Heavy Industrial Area	Tel : 1 242985 / 242988 Fax : 1 245558	Exports / Sales Officer Agricultural products marketing Leather goods production
MULENGA-MAINE Katongo	Mumbo International Trading Limited P O Box 33805 Lusaka	Tel : 287123 / 286290 Fax : 286290	Commodity marketing, castor bean, cassava pellets
MULEYA Jesse	Bulyo Industries Ltd P O Box 30778 Lusaka Plot 8079, Off Mumbwa Road, Chinika		Managing Director Vegetable oil, seed cake, stockfeed, grain marketing
MULIPA Pius P	Tambala Food Products Ltd P O Box 500 Blantyre Malawi	Tel : 265 671968 Fax : 265 671638	General Manager Purchase and process for wholesale, tea, rice, peanuts, peanut butter, cooking oil, milk powder
MUNAKOMBWE Joseph Hakola W	Munas' Farm P O Box 830068 Mumbwa Zambia	Tel : 01 800147	Managing Director Chairman Oilseeds Committee ZNFU Soybeans, sunflower, cotton, maize, animals
MWANSA Smit	Smit Milling Enterprise Limited P O Box 30948 Lusaka Zambia	Sumbaya Building Great North Road Chaisa	Manager Mealie meal, samp meal, roller meal, grinding mill
NGIMBU Henry N	Castor Oil Extraction Enterprises Ltd P O Box 110334 Solwezi Zambia	Tel : 08 821142	Managing Director Castor oil and sesame oil
NJEKWA Mukumbuta	Pharmanova (Zambia) Limited P O Box 71555 Ndola Zambia	Tel : 02 650337 / 348 Fax : 02 650124	Manager - Production
PHIRI Angelina Msambo	Department of Agriculture P O Box 50291 Lusaka Zambia	Tel : 260 1 281618	Extension Training Officer
RAMABULANA Gladys	Back to Eden Herbal Clinic P O Box 570 Louis Trichardt 0920 South Africa	Tel : 0159 22358	Director Herbalist

Participant's Name	Address	Communication Details	Business
SINGOYI Blackson Perry	Mwakwanda Soy Products Limited P O Box 90910 Luanshya Zambia	Tel : 512134	Managing Director Food processing, soy flour
TEMBA Margaret	Chalyandika Limited P/B CH 25 Chelston Lusaka Zambia	Tel : 260 1 260-407 / 283038	Manager Oilseed sunoil processing
ZYAMBO Songowayo	Zambia National Farmers Union TAZ House Chiparamba Road P O Box 30395 Lusaka 10101 Zambia	Tel : 222797 / 223222 Fax : 222738	Extension Officer

AGROINDUSTRIAL MARKETS WORKSHOP : Lusaka, September 6 - 15, 1994
RESOURCE PERSONNEL

Participant's Name	Address	Communication Details	Business Profile
BROWN Douglas Jerome	111 N 19 St Room 210 Rosslyn VA 22209	Tel : 703 235 9082 Fax : 703 235 5423	Agribusiness Advisor USAID/W/AFRICA Bureau Office of Sustainable Development
CHIPAKUPAKU Norman	International Resources (Z) Ltd P O Box 570667 Chipata Zambia	Tel : 260 62 22482 Fax : 260 62 21573 Telex : ZA 63030	Director Groundnuts, poultry, vegetable and beef Growers and exporters
CONNORS Thomas J	Capital Management Centers P O Box 2085 Corona CA 91718	Tel : 909 279 1499 Fax : 909 279 0274	Vice President Business Management and Expansion
DANIELS Freeman	USAID/SD/HRD 1111 North 19th Street Rosslyn VA 22209	Tel : 703 235 4442 Fax : 703 235 9086	Coordinator Human Resource Development Assistance Project Sub-saharan Africa
DOKIYA Tetsuo	JICA Zambia Office P O Box 30027 Lusaka Zambia	Tel : 251422	Agricultural Specialist
DOUGHERTY-BIDDLE Leslie	USAID Center for Trade and Investment Services SA-2, Room100 Washington DC 20523-0229	Tel : 202 663 2672 Fax : 202 663 2670	Senior Business Advisor Information of US and African Markets
FENDER Dr Frank A	USDA/FAS/ICD/FAS 14th of Independence Avenue SW Room 3245 South Building Washington DC 20250-4300	Tel : 202 690 1339 Fax : 202 690 3982	Director Foods Industries Division - Agriculture
FINLEY Wills	Muku Farms P O Box Private Bag 36 Woodlands Lusaka Zambia	Tel : 236021 Fax : 263973	General Manager / Owner Herbs and produce
GAMBRELL Bondie O	5855 Cealimela Avenue Los Angeles CA 90045	Tel : 310 641 8808 Fax : 310 641 9664	Commissioner for Economic Development State of California Small Business Owner
GAYLORD Bruce	Autumn Harp 61 Pine Street P O Box 267 Bristol VT 05443	Tel : 802 453 4807 Fax : 802 453 4903	Project Coordinator for new product development Natural skin care products
GUNDIDZA Mazuru	Aroma Chemicals (PVT) Ltd 23 Mountbatten Drive P O Box MR 52 Marlborough Harare Zimbabwe	Tel : 263 4 300053 263 4 303211 x 1499 Fax : 263 4 333407 Telex : 26580 UNIVZ ZW	Managing Director (Professor) Production of chemicals, drugs, cosmetics, essential oils, disinfectants, toiletries, natural products

Participant's Name	Address	Communication Details	Business Profile
JONES Cheryl	InterAfrica Corporate P O Box 34804 Lusaka Zambia	Tel : 228232-5	Managing Director
KNEPP Paul	USAID AFR/SD/HRD Washington DC 20523 USA	Tel : 202 677 8261	Project Manager Africa Regional Training Projects : HRDA, AFGRAD, ATLAS
LINDEMANN Donald	Land O'Lakes, Inc Don Lindemann, MS0050 4001 Lexington Ave N Arden Hills MN 55126 USA	Tel : 1 612 481 2843 Fax : 1 612 481 2002	Senior Packaging Engineer
MALICHI Bob	N W Bee Products Ltd P O Box 140096 Kabompo Zambia	Tel : 08 375085 Res : 08 375045 Fax : 08 375085	Manager Forest honey beeswax, forest products
MATZDORF Manfred	G T Z P O Box RW 37X Ridgeway Lusaka Zambia	Tel : 221474 / 228301-9	Government Advisor
MBEVYA K W K	Zambia National Commercial Bank P O Box 33611 Lusaka Zambia	Tel : 221360 / 221380	Projects Manager
MBULO Michael M	Small Scale Enterprises Promotion Limited P O Box 36102 Lusaka Zambia	Tel : 221663	Projects Manager
McCALEB Robert S	Herb Research Foundation 1007 Pearl St Suite 200 Boulder CO 80302 USA	Tel : 303 449 2265 Fax 303 449 7849 Email mccaleb@hrf.org	President Non profit research and educational (non- governmental) organization
MTAMBOH Ernest	Commonwealth Development Corporation P O Box 32000 Lusaka Zambia	Tel : 253657 / 253659 Fax : 250122 Telex : ZA 42850	Executive, Zambia (Economist) Britain investing in development
MUKWINDA Alfred	Lima Bank Ltd P O Box 32608 Lusaka Zambia	Tel : 229565-6	Senior Marketing Officer
MUMBULUMA P H M	Development Bank of Zambia P O Box 33955 Lusaka Zambia	Tel : 228576-94 Direct : 227015 Fax : 222426	Manager Small Scale Industries
MUSENGE R L H	Nshima Ltd P O Box 32093 Lusaka Zambia	Tel : 286451 / 286453	Director Stockfeed, hammer miller (maize)

Participant's Name	Address	Communication Details	Business Profile
NELSON John H	Purdue University Food Science Department 1160 Smith Hall West Lafayette Indiana 47907 USA	Tel : 317 494 8258 Fax : 317 494 7953	Retired V P McCormick & Company Inc Professor Purdue University Member SUSTAIN Program
NG'ANDWE Chiselebwe	Small Industries Development Organisation P O Box 35373 Lusaka Zambia	Tel : 222176 / 229704-7 / 222275 Res : 292174 Fax : 226994	Director / Chief Executive Zambian Government Assistance Program to Small Industries
OBUCHI Shinji	J I C A P O Box 30027 Lusaka Zambia	Tel : 291075	Assistant Resident Representative
ROBERTSON Ben	N W Bee Products Ltd P O Box 140096 Kabompo Zambia	Tel : 08 375085 Fax : 08 375085	Alternative Trade Coordinator Honey, beeswax, forest harvest
SHIMADA Hisetoshi	Embassy of Japan P O Box 34190 Lusaka Zambia	Tel : 251555	Second Secretary
STEEN Cynthia	Agriculture Cooperative Development International 50 F Street NW # 900 Washington DC 20001	Tel : 202 638 4651 Fax : 202 626 8726	Director, Market Development
STCOOP Adriaan Willem	Small Scale Enterprises Promotion Ltd P O Box 36102 Lusaka	Tel : 221663	General Manager (Acting)
VERMA Dr Bhoja Nath	SIDA/SVALOF/GRZ (MAFF) c/o Zambia Seed Company P O Box 35441 Lusaka	Tel : 292653 Fax : 292653	Sorghum Breeder Research

Honey Stick Case Study

1. Introduction

Honey Stick is a small product that tells a big story. The story has a beginning (the people of North Western Bee Products), a middle (Autumn Harp & The Body Shop), and an end (the consumer). I'm here to talk about the middle – of bringing a new, unique product to market. The journey honey and beeswax takes from African forests to consumers around the world is an interesting case to study.

I believe the key to this project's success was having a product in search of an ingredient, not an ingredient in search of product. People making connections made this product work. Information was shared around the world, difficult logistics were overcome, and problems were solved.

II. The Principles and Matching Needs

- A. Autumn Harp makes lip balm and needs unique, effective ingredients
- B. North Western Bee Products produces ingredients and needs a market
- C. The Body Shop needs unique products
- D. Consumers need products that work
- E. Intermediaries connect principals
 - 1. Tropical Forest Products connects North Western Bee Products and Cultural Survival
 - 2. Cultural Survival connects both to Autumn Harp
- F. Does everyone in the channel add value?
 - 1. North Western Bee Products leverages the work of individual producers, creates critical mass of raw ingredients, processes, arranges shipping.
 - 2. Cultural Survival connects both to Autumn Harp.
 - 3. Autumn Harp manufactures finished product with ingredients.
 - 4. The Body Shop distributes products to markets, promotes product, and retails to end consumer.
 - 5. Cultural Survival was not adding value, so they were eliminated from the channel.

- B. The story of the ingredients is interesting, and it does help sell the product. Selling by telling, like we do, only works if the product works, if it delivers what is promised by marketing. We've found that if a promotion is honest, it will be valid, otherwise it is hype and exploitive.
- C. The story communicates why the product is different, why it costs more, why the consumer should try something exotic. The story helps us compete.

VI. Pricing

- A. Philosophy of Autumn Harp dictated using enough of the ingredients in product to make project worthwhile. Over 25 percent of product is African beeswax and honey, the most that could be included given the other performance - ingredient needs (sunscreen, emulsifier, preservative, oils).
- B. Using natural ingredients is more expensive than petroleum ingredients (the base of competitive products).
- C. This means the product had to be positioned as premium
 1. Starts with unique ingredients, ingredients with a story behind them. This builds genuine rapport with consumer.
 2. Strong name and graphics make the product distinctive, says what it is and what to expect. People are more satisfied when a product turns out to be what they thought it was.
 3. A visible, progressive retailer (The Body Shop) has the opportunity to tell the story behind the product, give the product proper display and support to communicate value and premium position.
 4. Staff training is critical. Staff will sell the product they know, the product that is easy to talk about. Autumn Harp and The Body Shop provided training (raw wax and honey, "make your own honey stick" seminars, etc). Well-trained staff are able to talk to consumers about the product and validate the premium position.

VII. Distribution: Specialty vs. Mass Markets

- A. Need a channel that thinks long-term, as building value with unique ingredients and story take time. The premium position requires commitment; it isn't about short-term profit, then on to something new. The Autumn Harp/The Body Shop connection brings that commitment to market: two companies that are trying to make a difference.

III. The Product

- A. Honey Stick is a sunscreen lip balm. It has to moisturize and protect lips and provide SPF of 18.
- B. Unique ingredients: African honey and wax, babacu oil, borax as an additional emulsifier, vitamin E.
- C. Distinctive flavor/fragrance: rich, smokey, sweetness is powerful, to some overbearing.
 - 1. Turning a potential flaw into a positive attribute: balancing of fragrance and flavor
Creating a product with "mystique"
- D. Properties of honey and wax
 - 1. Wax helps emulsify the oil/water mix
 - 2. Honey soothes and moisturized the skin
- E. The development process: from accident to successful product (sometimes it just happens!). The idea for the Honey Stick lip balm was born when a batch of our lip balm was made from local beeswax with an unusually high percentage of honey. The batch did not meet our quality control standards and was rejected, but many employees kept and used the lip balm and it became a favorite of us all. Honey Stick was a product before we discovered the African ingredients, but the African ingredients moved the product from "good" to "one-of-a-kind greatness."

IV. Manufacturing Considerations

- A. Autumn Harp makes petroleum-free lip balms and uses a lot of beeswax...our manufacturing equipment has been specially designed and modified to accommodate the exacting conditions necessary when pouring Honey Stick. Still, every batch is a new "adventure" for our manufacturing team. Care has to be taken to adjust to changing conditions such as temperature and humidity.
- B. Careful quality control is necessary to ensure the product meets tough standards. If we let the quality slip even once, it could mean the end of a good thing. Consumers tend to be quietly satisfied; but they are vocal with their complaints!

V. Promotion: Is It "Hype"? Is It Worth It?

- A. We tell the story of the ingredients when we sell the product. We try to be accurate, complete, and honest. We did have some misunderstandings with this project, but we've taken pains to educate ourselves. That's one reason for this trip. We really believe in the product and the story. We (Autumn Harp and The Body Shop) constantly challenge what we are saying to make sure it is accurate and meaningful.

- B. Need companies with "credentials." Although Autumn Harp wasn't yet recognized in larger markets, it had a solid reputation in the demanding natural foods market. That reputation impressed the Body Shop which had built a strong consumer franchise. The Body Shop carried the message to the consumer, and they were trusted.
- C. A contemporary image can help. Honey Stick is a fairly simple product, but Autumn Harp and The Body Shop made it "hip" (choice of packaging, graphics, flavor). Consumers either love the product or hate it. It has a strong flavor/fragrance, so there is little middle of the road opinions. In spite of this duality, the product became the best-selling product by unit in The Body Shop in less than a year. It helped that consumers who liked it believed they were a select crowd.
- D. Control through vertical integration, from supply to manufacturing through retail, provides base of strength for a unique product. Since all players were "enrolled" in the process and the product, very little fell through the cracks or was out of our control.

VIII. Profit Sharing

- A. The Honey Stick project created trade, fun, and profit. Each party along the channel was able realize their commercial goals.
- B. North Western Bee Products received a fair price.
- C. Autumn Harp shared its profits with its employees.
- D. The Body Shop shared its profits with its employees.

IX. Conclusion

- A. If you follow the trail of the honey and wax, you will find hard-working people who care a great deal about their products. This is evident from North Western Bee Products through Autumn Harp to The Body Shop. This care, coupled with innovation and a problem-solving attitude made this project a success. It would have failed if everyone wasn't committed to quality or if someone had taken the attitude that it won't work.
- B. Many businesses try to follow the leaders, do what others do. Autumn Harp was trying to break new ground, do it differently, do what others weren't willing to. We were rewarded with a hit product and the opportunity to explore and create more.

APPENDIX C

Financial Services Institutions for Micro and Small Businesses: Doing the Deal **A time line of how Autumn Harp did the deal**

- 1980
 - o Autumn Harp started with an investment of \$1500 (\$500 cash + \$1000 loan.)
 - o comfrey salve, the first product, was made from herbs picked in local fields and woodlands, prepared on a kitchen stove and poured into jars on the kitchen table.
 - o employees traded labor for room and board.
 - o salve is sold directly to stores because distributors wouldn't buy an unknown product from a new, unknown company. Strong sales in stores that bought the salve motivated distributors to buy it. These large distributors gave the company national exposure and recognition.

- 1983
 - o received SBA (Small Business Association) loan to develop a new line of baby products, buy inventory and provide payroll to hire employees with skills needed to grow the company.

- 1985
 - o received bank loan, secured a line of credit and sold stock (private) to repay the SBA loan balance, develop a new lip balm product, buy inventory, move to a larger facility and purchase used equipment.

- 1987
 - o received SBA loan to hire a design/marketing company to upgrade lip balm packaging, purchase inventory and hire a national sales network of regional brokers to sell the products.

- 1988
 - o increased line of credit to buy inventory to meet increased demand created by the brokers and pay for design/marketing development cost over runs.

- 1991
 - o wrote a detailed business plan with the goal of capturing 10%-20% of the lip balm market in 5 years.

- 1992
 - o signed an agreement (joint venture) with a prominent marketer/retailer of skin care products to research, develop and manufacture new products This agreement guaranteed short term cash flow needs.
 - o on the strength of the business plan we sold stock (private), obtained an interest free loan and increased line of credit to move to a larger facility, buy new high speed filling equipment, develop new products and buy inventory.

- 1994
 - o the capital raised in 1992 is not adequate to fund present rate of growth so additional sources of capital including public/private stock offerings, new lines of credit, new joint ventures and other sources are being explored.

Note: I developed this timeline to complement the "Financial Services Institutions for Micro and Small Business: Doing the Deal" outline originated by Bondie Gambrell. My purpose is to offer a "small, very rapidly growing business" perspective to the points raised.

Financial Services Institutions for Micro and Small Businesses: Doing the Deal

How does a SME shop for financial services institutions?

1. Types of banks available.

- (a) Commercial banks.**
- (b) Credit unions.**
- (c) Domestic development banks.**
- (d) International development banks**

(1) World Bank & the International Development Association - provides funding to assist in the economic development of lesser-developed countries.

(2) International Finance Corporation - promotes further economic development by encouraging the growth of productive private enterprise in member countries, particularly in less-developed areas.

2. Opportunity to access loan guarantee programs.

- (a) Do they participate in these programs?**
- (b) Are they a preferred lender or do they process these types of loans on a regular basis.**

3. Reputation and financial strength.

- (a) Does the bank have a good reputation in handling business loans?**
- (b) Is the bank financially secure and stable? If not, you may find it difficult to obtain additional financing later.**

4. Experiences of other business owners in the area.

- (a) Investigate the experiences of local business owners in borrowing.**

(b) Chamber of Commerce meetings may be a good start. Also, trade associations may have information available on banks that commonly lend in the your industry.

5. Ratio of commercial loans to other lending.

6. Individual referrals.

(a) Often the best source.

(b) Try and get a referral to a particular person in authority at the bank.

What are alternatives to the formal banking system?

1. Debt financing.

(a) Private loans (secured and unsecured).

(1) Relatives.

(2) Friends.

(3) Business associates.

(b) Vendor financing and leasing.

(1) Good for equipment and inventory purchases.

(2) Vendor has a vested interest in seeing you get the financing (no financing - no sale).

(3) Vendor may agree to guarantee the loan to third party lender.

(c) Accounts receivable factoring.

(1) Immediate improvement in cash flow.

(2) Very expensive; not appropriate for businesses with low profit margins.

(3) Chargebacks can result in impaired cash flow; receivables must still be monitored.

(d) Loans from customers.

- (1) Appropriate when you are selling to larger end users, usually where your product is incorporated in the manufacture of their products.**
- (2) Care must be taken in your approach. One disadvantage is that you must disclose financial data to your customer.**

2. Equity financing.

(a) Public offering.

- (1) Used for raising large amounts of capital.**
- (2) Corporate shares are offered for sale on an open exchange.**
- (3) Subscription and underwriting costs are generally quite high.**
- (4) Government regulations can be very complex.**
- (5) Generally, the company must have a well established track record.**

(b) Private offering.

- (1) Appropriate for raising smaller amounts of capital (up to US \$1 million).**
- (2) Corporate shares are offered for sale to private investors who intend to hold the shares for long-term investment.**
- (3) Administrative costs of the offering are generally quite low.**
- (4) Regulations regarding this type of offering are much less stringent than in a public offering.**
- (5) An established track record will make raising the funds easier, but this can be used for new start-ups also.**

(c) Venture capital.

- (1) Available for start-ups or turnarounds that entail some risk but offer the potential for above average returns.**

- (2) Sources typically include wealthy individual investors, bank subsidiaries organized as small business investment companies, and venture capital funds.
- (3) Investment money is available at any stage of entrepreneurship.
- (4) Venture capitalists typically demand more control of management.
- (5) In addition to common stock ownership, they usually receive some combination of profits, preferred stock, and royalties on sales.

3. Joint ventures.

- (a) Agreement by two or more parties to work on a project together.
- (b) Usually formed by companies that have complimentary technology or strengths.
- (c) Generally formed on a project-by-project basis.

What initial information does the SME want to share with financial services institutions?

1. Business plan.

- (a) Although not required by most lenders, a good business plan will greatly increase the chances of obtaining financing as well as helping to ensure the success of the business.
- (b) Should be well-thoughtout and be presented in a standard format.
- (c) Use as much third-party information as possible to substantiate your assumptions.

2. Marketing plan.

- (a) More in-depth than the overview presented in the business plan.
- (b) May be required where the amount of financing sought is high.

3. Financial statements (business and personal).

- (a) Prepared in standard format.**
- (b) Statements should be current.**
- (c) Information must match that reported to third parties.**

4. Resumes of principals.

5. Amount of funds requested.

6. Collateral to be offered.

- (a) May not need to be disclosed immediately, but you should have some idea of what you are willing to offer.**
- (b) The value of your collateral will be based on the market value of the asset, not on what you paid for it.**

APPENDIX D

NORTH WESTERN BEE PRODUCTS TRIP REPORT

CONTENTS

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 - 1.1 Introduction to North Western Bee Products Limited
 - 1.2 History of our relationship with NWBP
2. SECTION TWO: REQUIREMENTS
 - 2.1 Ingredients purchased and products manufactured
 - 2.2 Current needs and buying practices
 - 2.3 Special processing or handling needs
3. SECTION THREE: OBSERVATIONS
 - 3.1 Community
 - 3.2 Need
 - 3.3 Sustainability
 - 3.4 Benefits
 - 3.5 Viability
4. SECTION FOUR: OTHER ISSUES
 - 4.1 Fair pricing

SECTION ONE: SUMMARY AND HISTORY

1.1 Introduction to North Western Bee Products Limited

North Western Bee Products (NWBP) began as a rural development project jointly funded by the Zambian and German governments to revitalize the traditional activity of beekeeping into a commercially viable business to improve the standard of living of small-scale producers by providing income to increase food self-sufficiency. There are currently 450 beekeeping groups, approximately 3000 beekeepers, active in the Northwest province districts of Kabompo, Mufumbwe, Mwinilunga and Zambezi.

In 1987, NWBP Ltd. was organized as a privately owned corporation. Currently, NWBP has 1,500,000 shares distributed as follows:

- 211,250 shares to district councils; locally elected representatives responsible for providing public services, maintaining law and order and assisting national and provincial authorities in developing and implementing local programs.
- 500,000 shares to the beekeeper's association.
- 525,000 shares to the UCHI Trust, a shareholders group set up by OXFAM to act on behalf of the beekeepers and Village Development Network (VDN) made up of eight voting members (two beekeepers, two representatives from the VDN, a lawyer, an economist, a business advisor and a member of the local church) and two non-voting members (the manager of NWBP and a member of the VDN).
- 263,750 shares are not allocated

The Board of Directors of NWBP is comprised of three members of the beekeepers association elected annually, three members of the UCHI Trust (an economist, a lawyer and a business advisor) and three members of the district councils. The board's primary responsibility is to agree upon prices to be paid to the beekeepers for beeswax and honey and to set the direction of the company.

NWBP, managed by Bob Malichi and advised by Ben Robertson from OXFAM, is committed to the continued growth and profitability of beekeeping activities as well as identifying and implementing new opportunities to strengthen village economies. They will utilize the organic certification granted the forest, the network of people with generations of knowledge and experience in sustainable use of the forest and well-organized collection and transportation systems to accomplish these goals.

Most of the operational activities of NWBP, including final processing and packaging, sales and marketing, transportation functions and financial control, are managed by the staff in Kabompo. The collection, purchase, storage and intermediate processing activities take place at depots in each of the four districts. NWBP also offers various commodities for sale to the beekeepers through company stores in the district depots.

NWBP processes from 20-45 tons of beeswax and 20-100 tons of honey annually. Because the harvest is dependent on wild swarms of bees and weather conditions, quantities can vary widely. Hives are cropped in May/June when Mwanda, a monofloral honey of light amber color, is gathered from Julbernardia trees and in December/January when Mupuchi, a medium amber honey, is gathered from a variety of forest trees, bushes and flowers.

1.2 History of our relationship with NWBP

Autumn Harp began buying African Fair Trade beeswax and honey imported into Wales by Tropical Forest Products (TFP) from Cultural Survival in 1991. The first shipment was purchased from the Tabora Beekeepers Cooperative Society in Tanzania and all subsequent shipments have come from NWBP. Because Cultural Survival was unable to dependably supply beeswax and honey, we are now buying directly from TFP.

SECTION TWO: REQUIREMENTS

2.1 Ingredients purchased/products manufactured

Autumn Harp buys NWBP purchased beeswax and honey and uses these two ingredients in the manufacture of Honey Stick lip balm for The Body Shop.

2.2 Current needs and buying practices

We anticipate using approximately 2000 pounds of beeswax and 1000 pounds of honey in the manufacture of 1995 Honey Stick lip balm requirements.

2.4 Special processing or handling needs

Tropical Forest Products processes/filters the wax into 2 pound blocks and ships to them to Autumn Harp through the port in Boston, Massachusetts.

SECTION THREE: OBSERVATIONS/CONCLUSIONS

3.1 Community

Zambia is a landlocked country sharing borders with Zaire, Tanzania, Malawi, Mozambique, Zimbabwe, Botswana, Namibia and Angola. Approximately 290,000 square miles in size, Zambia is located on a tropical plateau ranging from 1000 to 3900 feet above sea level. A dry season runs from April to November and a rainy season from November to April. Zambia's population of 8,400,000 is made up of more than 70 ethnic groups speaking about 70 tribal dialects and is growing at a rate of 3.5% per year. In 1953, European settlers formed the Central African Federation of Rhodesia and Nyasaland from Northern Rhodesia (now Zambia), Southern Rhodesia (now Zimbabwe) and Nyasaland (now Malawi). Northern Rhodesia gained independence when the federation dissolved in 1963 and became known as Zambia in 1964.

In the North Western province of Zambia, honey hunting dates back thousands of years and beekeeping is a traditional activity dating back over 150 years. Beekeeping is learned through practice and experience and these skills are passed from father to son at bush camps where several generations of men come together to hunt, eat, sleep, exchange ideas and to teach.

NWBP is revitalizing this traditional activity to provide additional income to small-scale producers. The beekeepers are shareholders in NWBP. Each group is represented by elected representatives who attend annual meetings to agree on prices, approve the direction of the company and review finances. Membership in the beekeeper's association is open to all beekeepers. As a former Peace Corps volunteer, I was interested in identifying a fair trade link for Autumn Harp to support. The beekeepers told me it would be best if we bought more wax and honey rather than give money and they would decide what to do with the additional profit. The last two annual meetings have been funded by the previous years' profits.

Beekeeping is traditionally a men's activity; the beekeepers told me they knew of only one woman beekeeper and of two women who pay men to manage their hives, and the men control the money earned. The brewing of "mbote" or honey beer seems to be the only opportunity for women to generate income from the honey. At NWBP, dozens of women line up early each morning to buy honey "washings" and waste honey to brew "mbote" to sell locally.

A project has been started by NWBP to provide income to women through the purchase of oil seeds for processing into cooking oil. NWBP has purchased an oil seed press and is buying peanuts and sesame seeds to test for oil extraction. Since planting and harvesting these seeds is work traditionally done by women, this activity has the potential to produce income for them. But NWBP noticed that often the men collected the money from the sale of the oil seeds. To remedy this situation, Bob Malichi proposed to the board that each village with a beekeeping group select one woman to be a member of that group so that women's interests would be fairly represented. The board approved this proposal.

OXFAM through NWBP has provided 10 kilos of peanut seeds, at no charge, to 140 farmers to plant. After the peanuts are harvested the farmers must return 15 kilos of peanuts to NWBP to be redistributed as seed. The farmer keeps the surplus which can be used for seed for the next season, eaten or sold.

OXFAM, through the UCHI Trust and Ben Robertson, has taken an active role in providing expertise to NWBP to allow them to grow and diversify the company's activities.

3.2 Need

Over the past decade, Zambia's economic performance has declined along with the world price of copper. This, combined with high oil prices, high inflation and growing foreign debt, has caused severe economic problems for the country. The average gross national product (GNP) per capita in 1986 was US\$304 and was on the decline. Because this figure includes all of Zambia, including the capital city of Lusaka and the copper belt, where most of the industry in the country is located, the GNP of the North Western province is probably considerably lower.

The North Western province, a remote part of Zambia, is virtually undeveloped and lacks industries that provide jobs. Most people live essentially a subsistence way of life with "nature" providing virtually everything a family needs to live. I traveled with Bob Malichi, manager of NWBP, to N'Dunga to visit one of the beekeeping groups. N'Dunga, typical of most towns in the Northwest province, is virtually untouched by modern development. They live much as they have for centuries using materials harvested from the forest, by fishing, hunting and growing crops. The village is surrounded by small family farms where maize, cassava, peppers, cabbages, yams, peanuts and many varieties of beans are grown during the rainy season. But, because of the long dry or "hungry" season and the use of rudimentary tools and methods, farming does not provide enough income to support a family throughout the year. For a family to sustain themselves, other sources of income must be found.

3.2 Sustainability

Sustainability is a complicated issue; following are chief issues pertaining to this question:

Hives: to make log or bark hives, trees are cut or their bark is removed. Often, a tree yields only one hive which is wasteful. Bark is also used to make carriers, containers, covers and ropes. NWBP and the Soils Association work with the beekeepers association to encourage the beekeepers to select trees that can produce several hives and sponsor contests to identify alternatives to bark and log hives. Entries in these contests have included hives made from banana leaves and gourds.

Harvesting: Traditionally, beekeepers crop half of their hives annually. When a hive is harvested all the comb is removed and the brood eaten. This is because the bees usually "abscond" after the hive is disturbed and leaving comb would be wasteful. By harvesting only one half the hives, the previous years' hives are available to attract swarms of bees. Recently, Zambian extension personnel have been advocating harvesting all of the hives annually and leaving a portion of the comb to encourage the swarm to remain with the hive. The beekeepers I talked with claimed they leave comb, but I believe most harvest the traditional way. The "best" way to crop a hive is unclear and resources have been unavailable to answer this question.

Fire: beekeepers encourage local conservation practices such as early season burning. Early burning is less destructive to the forest because later in the season grasses are much drier, burn hotter, making fires harder to control. Early burning also creates fire breaks that help slow forest fires that sometimes occur late in the dry season. And, late season burning is very disruptive to the foraging activities of the bees.

The beekeepers understand the implications of these issues...they told me, "they are the keepers of the forest and it's in everyone's best interest that the forest be preserved."

3.4 Benefits

Because the number of hives owned by the beekeepers varies widely it's difficult to determine the income generated by beekeeping. Furthermore, up to two thirds of the honey harvested is used to brew beer. And until recently most wax was thrown away. The following "real" numbers, ratios and costs, illustrate the income potential:

Assume a beekeeper owns 100 hives, that he crops 50 each year and that each hive produces 15 kilos of comb yielding 1 kilo of wax, 10 kilos of honey and 4 kilos of waste .

$50 \times 1 = 50 \text{ kilos of wax} \times 800 \text{ kwacha/kilo} = 40,000 \text{ kwacha/} *£38$

$50 \times 10 = 500 \text{ kilos of honey} \times 220 \text{ kwacha/kilo} = 110,000 \text{ kwacha/} *£104$

* assumes 1060 kwacha/£

During conversations with the beekeepers, I learned money earned from beekeeping allows them to buy medicine, school books and basic commodities such as cloth, soap and salt. They emphatically stated that this money was essential to them.

David Wainwright of Tropical Forest Products, a former VSO who helped plan and set up NWBP, is the primary marketing and sales agent for NWBP products; and he imports the beeswax and honey into Wales. He also oversees any processing required by his customers. David, as a "founder" of NWBP is very much trusted by the beekeepers association and is considered by them (and in fact is) an essential intermediary.

3.5 Viability

NWBP currently sells beeswax and honey to Tropical Forest Products, Autumn Harp and The Body Shop. NWBP is actively pursuing new markets for their products and have recently received orders from OXFAM for a large quantity of honey to be sold in their stores and from The Big Issue for wax for candles. NWBP packages and sells about 20% the honey they process through outlets in Zambia. And, The Body Shop is enthusiastic about Hand Wax, a new product concept presented by Autumn Harp, that, if accepted, will use large quantities beeswax.

Currently, less than 20% of the wax purchased by TFP from NWBP is sold to fair trade companies. The balance of the wax is sold on the world market. This means that current Autumn Harp/BSI demands for wax can be met. The construction of a new beeswax and honey processing facility in Mwinilunga, a remote border town that is virtually inaccessible during the rainy season, will help insure future needs can be met. But because the harvest depends on a variety of factors including weather and the behavior of wild swarms of bees that are beyond the beekeepers control, the supply will never be assured.

NWBP in searching for new ventures to lessen their dependence on the unpredictable business of beekeeping that will provide villages with income opportunities. Some of these activities include processing of oil seeds into cooking oil; the collection, processing and sale of organic botanicals and the marketing of traditional hand crafts. The strategy of diversification is in the planning stages and has not yet been reflected in a business plan.

NWBP has the facilities and equipment, operational, quality control and transportation systems, sales and marketing skills and management expertise for the volume of business they are currently doing. Through the addition of key advisors to the board, they have access to expertise required to remain successful at this level of business and to grow.

4. SECTION FOUR: OTHER ISSUES

4.1 Fair pricing

The biggest issue for me is how to determine what constitutes a "fair price." The fair price for organic honey was set by the Max Havelaar Foundation and TransFair International from data collected from honey producers in Latin America. David Wainwright believes (and I agree) that because this price is based on a very small group not representative of the "world's" producers that this price is too high. A meeting was held in early December addressing this issue, but regardless of the outcome, identifying a methodology to determine fair pricing is essential.

APPENDIX E

Date: September 1, 1994
Release: Immediate

Contact: Peg Devlyn
(802) 864-6710



AUTUMN
HARP

VERMONT EXPORTS SMALL BUSINESS EXPERTISE TO AFRICA
Bristol-- The U.S. government is sending Autumn Harp Product Manager Bruce Gaylord to Africa to offer technical assistance to small businesses there. Gaylord will hold workshops at the SUSTAIN (Sharing United States Technology to Aid in the Improvement of Nutrition) program in Zambia September 5 - 15.

Following that conference, which is funded in part by the U.S. Agency for International Development, Gaylord will travel into more remote areas of the country to spend a week visiting the African beekeepers who provide honey, and beeswax for some of the lip care products made by Autumn Harp, including the 'Honeystick' lip balm made here for The Body Shop, International.

Gaylord has worked with Autumn Harp for seven years, helping to bring it from a \$200,000-a-year company to more than \$3 million last year. "We hope we can use some of what we've learned to help businesses just starting there," Gaylord said.

Gaylord has worked as a U.S. Peace Corp volunteer in Liberia where he helped train local leaders and build schools, markets, roads and clinics to improve quality of life for people there.

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Business News Briefs

Autumn Harp exec sent to Africa

BRISTOL — The U.S. government is sending Autumn Harp Product Manager Bruce Gaylord to Africa to offer technical assistance to small businesses there.

Gaylord will hold workshops at the Sharing United States Technology to Aid in the Improvement of Nutrition program in Zambia from now through September 15.

Following that conference, which is funded in part by the U.S. Agency for International Development, Gaylord will travel into more

remote areas of the country to spend a week visiting African beekeepers who provide honey and beeswax for some of the lip care products made by Autumn Harp.

Gaylord has worked for Autumn Harp for seven years, helping to bring it from a \$200,000-a-year company to more than \$3 million last year.

"We hope we can use some of what we've learned to help businesses just starting there," Gaylord said.

B. Report by SUSTAIN Volunteer Don Lindemann

Introduction

It was my honor to participate in a 6 day Agribusiness Strategic Planning Workshop in Zambia as a representative of project SUSTAIN.

The workshop was sponsored by the USAID and the USDA.

Thirty-one micro, small and medium sized agricultural firms participated in the workshop which highlighted market research, financial management, problem identification and problem solving, information gathering and management, packaging for domestic and export products and financing agricultural business projects.

A large portion of the presentation focused on specialty crops; specifically medicinal herbs, and opportunities with specialized agricultural commodities unique to the South African region.

The workshop was intended to give the participants insight into the organizational and technical steps necessary for small firms to succeed on national, regional, and international markets.

The attached report includes notes taken by Rob McCaleb during the workshop.

Agribusiness Workshop

The Agroindustrial Markets Workshop was held in Lusaka, Zambia, September 5-15, 1994, and was sponsored by the U.S. Agency for International Development and the U.S. Department of Agriculture. It focused on four commodity groups:

- Natural food ingredients
- Essential oils, oleoresins and spices
- Medicinal herbs
- Processed staple crops (oilseeds, maize, legumes)

September 5, 1994: The first day of the Workshop provided some introductory remarks, background and preliminaries.

Dr. Stepanek, the new Mission Director of USAID Zambia, is literally just off the plane having arrived to begin his assignment here. He expressed his desire that the country will benefit from USAID programs while under his direction.

Rudolph Thomas, Deputy Director of USAID Zambia opened the workshop with a description of the program, as a forum to analyze and develop markets, specifically those in the areas of natural foods, essential oils, herbs, medicinal plants and processed staple foods. While mining contributes to the economy of Zambia, agriculture is the mainstay of most families. Besides growing crops for food and income, plants are gathered as medicines, foods and teas. He stressed that many African plants have yet to be researched which may have important uses. There is tremendous potential for development of these resources for domestic use and export. Dr. Thomas stressed that the increased interest in alternative medicine, environmental conservation, and herbal teas all increase the market here, regionally and abroad.

Dr. Shimaponda, Deputy Minister, Ministry of Commerce and Industry, expressed concern about the large quantities of produce in Zambia which go to waste. He stressed that the primary source of raw materials, the individual farm families, play a key role in the quality of the finished product. If the raw material is of poor quality, the manufactured product will be substandard. Small and medium enterprises have been identified as a sector which can help greatly in the development of the country by employing large numbers of people.

He said that seminars in the past have been valuable discussions, but have resulted mostly in recommendations without major implementation. This workshop is planned to be interactive and help participants emerge with direct benefits, including solutions, plans and strategies for increasing existing markets, and creating or entering new ones.

Betty Wilkinson, Private Sector Advisor for USAID Zambia discussed the American success story with agriculture, its agricultural beginnings, and emphasized USAID's commitment to

agricultural research and extension as ways to aid the agricultural sector. She listed some of the other donor organizations active in Zambia like Africare and many others, which are working to increase the success of this sector.

GOALS AND EXPECTATIONS

The Workshop's main facilitator was **Jerry Brown, Agribusiness Advisor of USAID's Africa Bureau**. He asked participants to discuss their hopes and expectations for the workshop to assure that the planned program would meet their needs. Many were listed: increasing market share, identification of new markets, access to financing, information on product development and utilization, new technology, and information on exporting.

Mr. Brown discussed how the program was planned to address each issue and summarized the workshop objectives:

- Networking
- Technology access in Southern Africa
- Marketing strategy, especially for regional markets

He assured workshop participants that they can expect to take away tangible benefits from the workshop; a business plan, a list of participants, a directory of useful names and numbers, and information on people who can serve as resources to help.

Marketing Your Products

Mr. Brown stressed that producers must have a market before putting the first seed in the ground. One of the main problems of small producers in growing and expanding markets is the very fact that they are small. They have inadequate access to information, technology and financing. The workshop will help them work together, organize to share expertise and become their own resource pool.

The focus of the workshop is on the commodity systems approach. Each participant received a copy of the book *A Commodity Systems Assessment Methodology for Problem and Project Identification* by **Jerry La Gra**. It describes a systematic method of problem solving and planning a strategy to get from concept to market. For each factor in the process, it seeks to ask **who, what, how, when, where, why, and how much?** For example, in defining a market for a product one must ask who buys, what do they buy, where, why, when, how much and how?

Mr. Brown led the group through a problem solving exercise to demonstrate how problems can be turned into opportunities. Many problems are simply opportunities in disguise. The statement of a lack or need for something introduces the opportunity for someone to fill that need which often represents a potential for business. For this exercise, participants were divided into three groups to discuss jasmine oil, medicinal herbs and sesame.

For jasmine, the problems identified included lack of market information, lack of information on how to grow jasmine, and no seeds. Solutions: Plant Oil Association, Essential Oils Production Association, SACAR (SADC institution focusing on research).

The medicinal herb group identified secrecy of traditional healers, high cost of health care in the U.S., toxicity, efficacy and herb identification as problems. Solutions included market opportunity to meet health care problem, untapped potential, working with healers and the current regulations by FDA on drugs vs. food products in the U.S. market. Europe was considered non-problematic because of their more open acceptance of traditional medicines.

The sesame group identified problems such as lack of government support, lack of technology, and insufficient knowledge of any regional market. Solutions: Cold press technology, which will be demonstrated by Africare later this week, OILS associations, sources of information and market studies.

Strategic Planning

Dr. Frank Fender, Director, Food Industries Division Foreign Agriculture Service, USDA, conducted a session on the importance of strategic planning for small, micro and medium size entrepreneurs. This began with the basics: What is a strategy for? To achieve a purpose.

A strategy is an exercise to meet the competition under the most advantageous conditions. A strategy must be developed regardless of the size of your business, it is not considered a luxury by large businesses, it is a necessity. A plan integrates the major goals of an organization with the policies and the purposed sequence of action into a coherent whole. Strategic planning puts planning into a broader context.

What is the business purpose? To make a profit. How to achieve this? Through goals and objectives related to each of the key factors in a business: people, finance, product or service, and time. All businesses must work within these constraints. There are also external constraints which a company may not be able to control or plan for (devaluation or a change in government policy). Companies must use their resources to provide the product or service at the right time, using the human resources available and with adequate financing. Many small businesses believe they don't have time for strategic planning, usually because they don't understand that such planning is a key to the success of the business. It is largely based on common sense, and saves time in the long run. A strategic plan is best developed by teamwork, bringing different views together. Plans must be flexible, able to adapt to changing conditions, including commodity prices, interest rates, currency fluctuations and other factors.

Workshop materials were distributed covering these subjects in far more detail, and provided resources to help each participant in building sound plans and a successful business. The participants provided real life examples of problems and successes in each area. One proposed a plan for an extension service. He outlined the type of people he would need, training them both to produce and to market, and how to decide what to market. The extension service would help rural farmers to produce marketable products. His plan included information about inputs and

organization. Money to run the service is derived from a subscription fee (levy system).

Another participant developed a quick plan for a groundnut operation, to replace maize production in his region which is far removed from maize consumption areas.

Another described a project to diversify tobacco farming into castor production. Their group has been unable to get a grant, so they developed a more detailed plan. They have 400 member farmers. They have considered training and using the strengths of their current collection and marketing organization to help farmers to shift into new production within five years.

September 6, 1994:

Each day began with a participant's presentation; a case study of a business and how it was developed, or is developing. Catherine Mwanamwambwa of Binzi, Ltd. began this day describing a new project to market high value plant extractives, oleoresins of paprika and calendula.

Commodity Systems Approach (Production)

Jerry Brown provided more information about this approach and how it relates to production of a crop. The problem identification approach helps to identify inefficiencies such as untrained labor, lack of knowledge of the product, social concerns, and lack of appropriate technologies.

Factors which can affect production costs include inappropriate harvest timing, poor labor management, insect and disease damage, losses due to mishandling, poor infrastructure, lack of technology, deficiencies in transport, storage and others. To minimize such losses businesses need knowledge, technology, and resources. Where do you get these? Perhaps the most important tool is to keep lists of resources; local and remote.

For knowledge and technology some resources are:

- Zambia National Farmers' Union
- Ministry of Agriculture
- Export Board (of Zambia)
- Zimbabwe Trading Corp
- Southern Africa Foreign Trade Association
- Research Stations
- Set up small farmer business development organizations

(These resources have not always viewed it as their responsibility to get information out to small farmers. Extension services have not had the money, so it is private sector's responsibility to get what it needs from these resources. Brown emphasized it is YOUR responsibility to get what you need from research centers, extension services, marketing boards, associations, etc.)

Before entering market, a business needs:

- market (research)
- finance (rates, availability, sources)
- cultivation practices (how, who else)
- land (availability and fertility)
- transport (cost, distance, availability)
- training
- seed
- technology
- climate

For production, these are required:

- land preparation
- time/planting
- time/harvest
- spraying/pesticides
- fertilizer

Again, according to this approach, for each of these, one must determine who is to do it? how? when? etc.

BUSINESS PLANS

The workshop focused on business planning, with each participant beginning to develop a sound business plan with the help of resource people including economists, agro-economic experts, business leaders, the workshop facilitators and each other.

This workshop stressed the importance of working together and using local resources. Extension services, research agencies and other resources will not always be effective without persistent effort, and all were advised to make the most of these resources.

September 7, 1994

OILSEED RAM PRESS

The morning agenda was a visit to **Africare** which has procured and distributed ram presses to various parts of Zambia, for regional production of edible oils and castor oil. Participants learned how seeds are taken from the field, cleaned and pressed by hand. (See Attachment 1)

HERBS AND MEDICINAL PLANTS

The afternoon session, workshop co-facilitator **Rob McCaleb, President of the Herb Research Foundation in Boulder, Colorado**, introduced the subject of herbs as alternative crops. He described the wide diversity of products categorized as herbs, from the least processed, dried plant parts sold as culinary herbs or crude drugs, to more sophisticated products, herbal teas, blended traditional medicines, powdered herbs in capsules or tablets, liquid extracts, essential oils, oleoresins, and semi-purified or highly purified plant extracts, including pure plant chemicals. The various products are sold as natural foods, dietary supplements, food, cosmetic and drug ingredients.

Mr. McCaleb showed by means of a widely varied slide presentation, the signs of and reasons for increased interest in herbal products in the U.S. and Europe, and described a vibrant, growing business in all categories. Among the factors driving this increased interest:

1. The health care cost crisis in modern medicine
2. Concern for the toxic side effects of potent chemical medicines

3. A growing fascination with "alternative" medicine
4. A desire for self-care using natural products to improve health
5. Concern for the environment and its dwindling resources
6. A growing respect for the wisdom gleaned by centuries of herb use by different cultures.

He showed slides of herb growing, from small family plots to huge commercial farms, but stressed that many herb crops cannot be grown in Europe or the U.S., are impractical for large-scale production, or are too labor-intensive to harvest. Because of this, a large part of the world's herb production will remain in tropical countries with developing economies.

McCaleb mentioned several examples in which simple improvements in technology, seed or harvest timing had dramatically improved the profitability to herb farmers, and highlighted the importance of cooperation between industry, producers, researchers and government in developing successful businesses in herb production.

Finally, he provided specific examples of herbs which have been well researched and have grown into huge businesses in the phytomedicine (plant-derived medicines) markets in Europe and Asia, and the "dietary supplement" industry in the U.S. These included the plants *Echinacea*, an immune system stimulant, *Ginkgo biloba*, which increases circulation to the brain, *Silybum marianum* or milk thistle, which helps to protect the liver and treats liver disease, *Valeriana* as a sleep aid, bilberry (*Vaccinium myrtillus*) which increases circulation to the eyes and strengthens capillaries. Yohimbe tree bark was mentioned, from which *Yohimbine*, an alkaloid used as a blocker of alpha-adrenergic receptors, is known to be a particularly effective aphrodisiac. In referencing the tragedy of the slaughter of the rhinoceros for purported similar effects from horn consumption, he suggested the use of Yohimbe tree bark as a far more effective substitute. McCaleb's organization, the Herb Research Foundation, has conducted several international development projects in Africa, and offered assistance to help African producers to develop this promising market.

September 8, 1994 - field trips to a hammer milling operation, and an herb farm or a large Dairy producer started by USAID money ten years earlier.

I opted for the dairy farm with Freeman Daniels. The farm was located just outside the city limits and was huge by every measure in Zambia. They had 1500 head of dairy cattle with 900 fresh cows. The cows were of champion stock and the facilities were fairly modern. Sanitation was adequate but did not meet U.S. standards. The milk was pasteurized and packaged on location and distributed to the city of Lusaka. Milk would stay fresh at 40 degrees F. for up to 7 days. (See Attachment 2)

September 9, 1994

SUCCESSFUL BEEKEEPING IN ZAMBIA

Friday's agenda began with a participant's presentation on successful marketing in the natural ingredients area, specifically, bee products.

NW Honey Cooperative's operation is in NW Zambia, certified organic by British Soil Association, which requires annual inspection. They have 189 groups of beekeepers, ~15/group,

each with about 500 hives. ~20kg honey per hive, 1kg-1.5kg honey. Theirs was the first honey in the world to be certified organic.

Responsible Forests Management Scheme is a group which certifies responsible wood production practices. These programs have allowed them to sell their products more easily and at higher prices. They have had financial support from external organizations including OXFAM, the Canadian and German governments. These funds always come with conditions, getting what you do want, you must accept some things you don't.

GTZ, a German development group provided funds to start the project in 1988 and then stopped their support saying it was now viable, so UNDP contacted and pledged \$750K. The "huge" investment in the project has not been paid back, but with 200,000 pounds per year income, it may eventually. More importantly, the goals of the donor organizations have been met, in terms of development and employment in the region.

They are now diversifying into new products, both regional and export, plus using resources like excess transport capacity in other businesses (e.g. distrib. Coke). Castor, soya, baskets, handcrafts, wall coverings, rare honeys and potpourri ingredients.

Bruce Gaylord from Autumn Harp described the company, which began to develop natural body care ingredients, non-petroleum, renewable resources are their focus, and this has been a successful strategy. He stressed the importance of a written business plan, which was a major factor in turning them into a successful business. They were losing money until they developed one. They identified three different partners, and settled on the Body Shop. They are using the products of the NWB coop in products for The Body Shop. One key strategy of AH is to buy directly from producers to increase income and sell directly to the retailer, Body Shop.

They are now producing a wax and oil based hand cream, which will increase the amount of bee's wax they can buy. They plan to diversify into other products. He mentioned the growing market in natural products, which has now firmly entered the mass markets in the U.S. and Europe. Consumers are responsive to the "fair trade" issues of buying as directly as possible and avoiding exploitive business practices in the developing world. They are increasing focus on *Jatropha* oil in preference to castor oil, because of its diversity of uses. It can be used in body care products, cooking oil, and can even run engines.

Alternatives Technologies International is the major donor group they work with. The group has helped them by compiling information on jatropha oil, and conducted (or financed) lab testing.

There was a discussion of the "fair trade" movement, and the amount of the profits of a business are paid to the raw material producer. Producers at the NW Bee Coop are paid well above world market price (reportedly 20-60%), but feel it should be more. Bruce Gaylord pointed out that increased raw material costs can increase retail price to the point that the business may fail. Fair trade issues will be discussed further in later sessions of the workshop.

John Nelson (ret.) from McCormick and Company alerted producers that many companies, especially large ones who do not use "fair trade" as a marketing point will not be willing to pay substantially above market price. Recommended contact: TWIN 4th Fl / 5-11 Worship St. /

London EC2A2BH FAX 44-71-628-1859 E-mail twin@gm.apc.org is an organization which publishes a network, providing information about international trade. Also, members can call and ask "any question."

PACKAGING AND MARKETING FOR SUCCESS - DON LINDEMANN

(A complete and detailed copy of my presentation is available - See Attachment 11)

I spoke at three separate times, each of which encompassed different packaging considerations. The first day included packaging for export and marketing considerations. I presented a short video on international shipping issues, including protection of cargoes against damage and theft.

The first presentation defined the kinds of stress shipments endure in international commerce, and what kinds of packaging practices can be used to prevent such damage. Included in the long list of suggestions were moisture proof linings, well sealed containers, cushioning and dunnage, strength specifications of packing materials, etc.

The section on theft prevention discussed masking the identity of the shipment, by including no logos or descriptions of any kind, but only the minimum of information needed to assure the delivery of the cargo to its intended recipient.

The second presentation discussed the often baffling intricacies of marketing internationally from a Packaging perspective. I discussed desirable and forbidden colors specific to many cultures, plus symbols, numbers and icons or pictures which can help or hinder sales in different cultures. I stressed that successful international marketing depends on becoming familiar with these particulars.

The next session involved the works of a large number of non-governmental organizations who help companies in Zambia.

IESC: International Executive Service Corps has offices all over Southern Africa. American nonprofit using volunteer retired executives with offices in 54 countries and projects in 90 countries. They have 13,000 retired volunteers in the U.S., with 200 now working in southern Africa. Their services:

1. Managerial or technical assistance is available in virtually every field with around 1,000 projects a year. They work with private businesses, find a company that needs help, and recruit a volunteer with specific knowledge to help. They visit business and spend 2-3 months working with a counterpart in the company to help train and do the work.
2. Business linkages - sets up linkages
3. Business research - providing information about getting into a particular business.

The Oilseed Industry Liaison Service (OILS) represent the producers of sesame and soy oils, and are assisting in the development of sunflower and groundnut oils. Groundnuts, however, are being developed by several other projects, as is the soy oil, which is being handled by the legumes group. Africare is working with OILS on the sunflower project.

OILS is looking for funding to advance the production of sunflower oil and marketing. They are

also developing a database and information center on oilseed growing and oil production and marketing.

Funding is primarily from USAID, with some contributions from companies in the U.S. They also ask that client companies help with funding also. Debt for development funds in Zambia allow them to do additional projects here.

The Small Sector Business Association of Zambia, formed in 1982. Members are manufacturers, service providers and other entrepreneurs. The association provides research, information, training and other services to small businesses. They work with many local and international groups and can help businesses connect with the resources they need. Their funding is from membership dues, without substantial outside support.

Zambian National Farmers' Union represents all farmers to give them access to technology, inform them about government policies and events relevant to their business. Farmers have elected representatives who work on committees to accomplish the goals of the organization. Major function in the past was to talk to the government about prices, but that is now supposedly governed by free market forces.

In addition to providing information, they are talking to commercial banks about high interest rates. They have convinced the government to establish a strategic reserve for maize which will help stabilize prices, but this is a limited program. They are now creating a commercial structure of farmer owned marketing groups to buy maize and sell through a commodity exchange to traders. This can be very attractive to traders, who are not keen to buy 50 bags here and there from each farmer.

The Tobacco Association of Zambia helps tobacco farmers by negotiating the sale of local tobacco crops. There are 400 growers (50 major) in the Assn. They may get into the manufacturing business to increase the profitability to members. They are looking for complementary crops to replace tobacco, the sales of which are dropping. While Mr. Wallace, their executive director, thinks there is no clear evidence of harm from smoking tobacco, he allowed that there is some "statistical evidence" that we must pay attention to.

September 12, 1994

THE POTENTIAL OF HERBS FOR AFRICAN AGRIBUSINESS

Rob McCaleb provided details about the marketing of herbal products. He described the diversity of markets:

International Herb Markets

Natural product ingredients

Herbal teas

Dietary supplements

Potpourri

Spices

Extractives:

Essential oils

Oleoresins

Hydroalcoholic extracts

Specialty extracts

Future Foods Ingredients - phytochemical (plant chemicals) with health benefits

Flavonoids

Antioxidants

Medicinal plants

International "conventional medicines"

Phytomedicines

Pesticides

Traditional medicines

Local

European

Asian

North American (including Canadian)

Preventive Medicines

Cosmetic ingredients

Industrial ingredients

Less sophisticated products require less capital to produce, but yield lower profits as well. In deciding how to enter the marketplace, it is important to consider the balance between the costs and benefits of adding value. For example, in marketing herbal medicines, like cough syrup, the highest profit may be in selling a finished, bottled and labeled product. But the cost of shipping the glass bottles, especially overseas, may be higher than the charge to have it bottled and labeled abroad, by a custom packer.

STRATEGIES

Producing for existing markets: This is the easiest choice, requiring the producer only to find an appropriate crop, identify customers and gain their agreement to buy if quality is adequate. It is important to produce to buyers' specifications, to avoid the chance that the crop will be rejected.

Meeting specialty needs: Whether producing an unprocessed raw material, or a value-added product, there are specialty markets which may pay more for something unusual, or which must be produced locally. For example, *Centella asiatica* (gotu kola) is now grown in Hawaii and air-freighted to the U.S. fresh, because it is thought to produce a better extract than that made from dried herb. If the quality of the herb being extracted can be assured, there may be a market for the extract made only hours after picking in the field.

Introducing New Herbs: This is a much greater challenge, because public education is required to create demand for the herb. There are examples of new herbs which grew very rapidly in popularity in the U.S. *Tabebuia* (pau d'arco) is an example of a major herb on the U.S. market which was unknown 10 years ago.

Popularizing African Traditional Medicines: Regional and traditional medicines have become very popular in the U.S. and Europe. Traditional Chinese Medicine and Indian Ayurvedic medicine are good examples. More recently, Native American and Amazonian traditional medicines have become more popular. African traditional medicine has never been popularized, representing a major potential opportunity. Certainly, the traditions of herb use in some areas of Africa are as ancient as anywhere. This market is oriented toward a new found respect for ancient wisdom and the belief that there are useful health-promoting herbs known to traditional healers, which are not yet being used in modern health care.

Saving Threatened Herbs: Saving wilderness is an important theme to health-conscious consumers. Herb growers who bring into cultivation an herb which is being threatened by over collection improve the marketability of their products, while protecting the environment.

Some examples: *Pygeum africanum* (*Prunus africanum*) is a tree which is being extensively harvested from Cameroon. Unless steps are taken to protect it, it will become scarce and expensive. *Hydrastis* and *Ligusticum porterii* are among many American medicinal plants which are becoming scarce.

Using threatened plant lists to predict markets: Networking with conservation organizations may be a good way to plan ahead for a market position in something which is growing in popularity, but is not being sustainably produced.

Create a Niche: Niche marketing relies on differentiation of your product and targeting specialty buyers.

Strive for long term relationships: Maintaining a reputation is important, and this is best done by being known as a reliable source of either products or income, or both. For example, if you have a good relationship with small farmers who produce for you, they will be more loyal to you. If you are known by buyers to produce consistently high quality, they will be more likely to be fair with you. Strive for long term contracts if possible.

Connecting With End Users: Low-tech high quality: It is possible to produce value added products without expensive equipment. Hydroalcoholic extracts (tinctures) are a good example.

Fresh herb extracts: Already mentioned for gotu kola, but "Extracted fresh from our organic herb gardens can be a powerful selling point.

Local/Regional needs: There are a number of herb-based medicines on the Zambian market, including cough syrups from Zimbabwe and South Africa. Not a single ingredient in these remedies is impossible to obtain in Zambia. One easy way to enter the value-added market is to see what consumers are buying from elsewhere and make it less expensively here.

Export Income: After establishing a local market it may be possible to expand into regional or overseas markets. Adding value through social and ecological conscious sustainability: Environmentally aware consumers want to buy things which are not depleting natural reserves. This is an important selling point.

Organic: Organic herbs in the U.S. command three times the price of conventional crops.

Certification: This is a problem currently, because American and some international certifying agencies for organic production require annual inspections and soil samples. In smallholder production of herbs this is not practical. It is possible that a different scheme can be developed to certify whole regions as organic. The Herb Research Foundation is working on a program to certify both environmental and social consciousness in herb production, which would appeal to those concerned with sustainability and fair trade.

To illustrate the challenge of marketing herbs for health benefits, Mr. McCaleb presented a chart plotting increasing scientific validation on one axis and public awareness on the other. He emphasized the challenge of popularizing unknown products.

FOOD, BEVERAGE, SPICES AND HERBS PACKAGING - Don Lindemann

I discussed food and beverage packaging, beginning with fresh fruit and vegetable packaging. Spoilage is the major concern, because they are living foods. At 40°F many chemical reactions begin which can degrade quality. I provided details about the number of days each type of products like meat, fish and others can be held without spoilage (i.e. fish 2-3 days, pork 9 days, beef 14, etc.).

I further discussed the special needs of herbs and spices, the types of containers, their properties and the differences between bulk and consumer packaging. Included in my presentation were details on the following matters:

Functions of packaging: The types of packaging including consumer, industrial, and military were discussed. I pointed out the only time a consumer usually notices the packaging is if it fails. I discussed legal requirements and consideration.

Packaging materials: Wood, paper, glass, metal, adhesives (natural and chemical) and plastics were discussed. (See Attachment 11 for complete and detailed presentation)

SPICES, OLEORESINS AND ESSENTIAL OILS

John Nelson described the difference between (fixed) oils which are expressed, oleoresins which are extracted with solvents, and essential oils (volatile oils) which are produced by steam distillation. He distributed figures from the USDA detailing imports and exports of essential oils for the U.S. market. As a general rule, he said, doubling the U.S. numbers provide figures for world demand. He commented that USDA's Tropical Products brochure discusses coffee, tea and similar commodities, plus ginseng.

Spice imports in 1992 were \$369MM, up 3% from last year, primarily in capsicum, turmeric and cumin, and due to a recent increase in American popularity of hot sauces. But, lower prices for black pepper caused a drop in overall value of spices. Market forces are extremely important. One needs access to the latest market information to be successful. Dr. Nelson recommended regional cooperation to keep this information current. Black pepper is the most important spice in international commerce, and third in value.

Vanilla bean imports equal \$69m annually. Saffron, vanilla beans and cardamom are the highest

value spices. Saffron = \$1 mil per ton, 304 tons imported last year. Total food industry in the U.S. is \$600 billion.

SOURCES OF SPICES (Of 35 countries listed, no African countries are included)

Hot chili might well be a good product for Africa, and there are some projects here to produce African peppers for export. Turmeric and vanilla are also possibilities. Ginger is mostly from Jamaica and the far East. John stressed the variable market in all spices, and the importance of good market intelligence.

Historically, spice business has gone from harvesting wild plants, selling to increasingly larger intermediaries. The trend now is to grow industrially and eliminate intermediaries. Spice companies are not out beating the bushes for new sources, but relying on big traders to bring them large quantities.

MARKETING AND QUALITY

Processing of spices: Typically, we buy very dirty spices in poor quality burlap bags, very inconsistent. Then they are cleaned repeatedly in the U.S. Wild harvested plants are often bacteriologically problematic because they are dried on the ground. This often necessitates fumigation. After cleaning, spices are milled and packaged. All of these steps add value, but none of it is done here. To increase income, producing countries need to move as far as possible away from just selling dirty bags of crude and dirty plant material toward increasing value-added production in country.

New products vs. existing products: Existing business is usually low capital, with uses, specifications and markets identified. New costs more to get into, but may be more lucrative. New market doesn't necessarily mean new products. For example, with much of the spice supply being met by countries like Pakistan and Indonesia, there are no areas without DDT contamination.

September 13, 1994

Dr. John Nelson presented some basics of marketing, primarily in terms of assessing consumer needs and preferences, and distinguishing your product from others.

There are **only two** basic marketing positions: **low price brand, or a brand differentiated in some way as superior**. It is important to identify some marketing position that consumers will identify with. For some products, it may be a desire for greater safety, or convenience, appealing to a desire for luxury products, or local appeal.

Maybe your consumer wants to buy products made at home, so "Made in Zambia" could be a distinguishing point. Always consider your competition too. What positions are they taking? Are you trying to distinguish your product in the same way, or a different way?

Nelson also discussed the difference between a marketing-driven company and a production-driven company. The marketing orientation is considered the best for most consumer products companies.

September 14, 1994

QUALITY IS THE KEY

Rob McCaleb and John Nelson presented details of quality management. McCaleb began with quality philosophy. Quality Assurance (QA) is “doing the right things”, that is the design of quality systems, training programs, inspection systems and defining how quality will be measured. Quality Control (QC) is “doing things right” and involves implementation of QA policy. QC means inspection, testing and quality management at the production level.

Quality is free - It is said that only quality can increase both market share and profit simultaneously. It makes your product more valuable, and appeals to more consumers. The key point of the popular quality management book *Quality is Free* is that spending time and money to improve quality always pays off.

Quality is specific - The management of quality is specific to the type of product. Just as low technology raw materials like unprocessed crops are least expensive to produce, the testing is often less expensive as well. For example, quality in most food products can be done with the senses: assessing cleanliness, color, flavor and aroma. Testing extracts requires chemical analysis with costly laboratory equipment. It is also specific to each step of the production process.

Participants helped to define the parameters of quality in the farm crop:

- Identity - the right plant
- Purity - no other plants or contaminants
- Contaminants include pesticides, animal manure, hairs, feathers, insects, dirt, rocks, metal, glass, plastic, paper and others.
- Microbial - mold and bacteria can result from improper drying or storage.
- The quality parameters at each stage of production were discussed:
- Milling - correct particle size, minimal dust.
- Warehousing - maintaining rodent and insect-free warehouses.
- Transport - tight trailers on trucks and containers.

McCaleb described how dirty produce from the farm level requires cleaning at increasingly higher prices, by the collector, exporter, trader and manufacturer. Quality training and management at the farm level is essential, it saves money and time at each subsequent stage of processing. One of the goals of his international development has been to show how to achieve higher profits for farmers (fair trade) and better quality.

He described a commodity market in which prices rise and more farmers grow the same crop until it is over-produced. If prices crash, farmers quit growing that crop. The quality is likely to fall too, as experienced growers stop producing and buyers scramble to get whatever they can, increasing poor quality supplies.

Thus price, availability and quality are all linked. All can be stabilized by long term contracts between buyers and producers, and by quality management at the farm level.

The key is to convince traders and manufacturers that it is worth paying the farmer more, and to train the farmer to maintain excellent quality produce to justify the higher price.

MEDICINAL PLANTS, HEALTH AND ECOLOGY

James Duke, Ph.D., USDA's leading medicinal plant expert and a prolific author, began by emphasizing the continuing importance of medicinal plants to modern medicine, and their value.

Taxol, from the Yew tree (*Taxus*) is the newest drug approved against cancer in the U.S., ovarian cancer in this case. Expected value by 2000 is \$1 billion. It has been synthesized, and produced in tissue culture, but it will probably continue to be made from the plant.

Etoposide, from the mayapple, *Podophyllum* is used against skin cancers warts and other conditions, worth \$275 million. It is still extracted from plants.

Closer to home, the Madagascar periwinkle is the source of the two major chemotherapy alkaloids vincristine and vinblastine, worth \$100 million. It too is still extracted from plants.

Four major drug companies have now returned to the rain forest looking for new drugs from plants:

- Merck \$2 million deal with Costa Rica - CR would get a cut (perhaps 2-5%) royalty.
- Bristol Myers Squibb (makers of etoposide and taxol) has a deal with NCI and Conservation International (unknown value of deal)
- Pfizer has a \$1mil deal with the NY Botanical Gardens to research tropical plants.
- Eli Lilly (30 year producer of vin from peri) put \$8 mil into Shaman Pharmaceuticals. While the others are primarily random sampling operations, Shaman uses traditional wisdom to predict useful plant medicines.

Again, a portion of the profits would go to the countries in which they investigate.

Sustainable use of the forest is, in the long run, more economical. For example over a 10 year stretch, brazil nuts and rubber tapping alone will yield more money than cutting down the forest, selling the wood and ranching cattle or raising soybeans on it. AND you still have your forest. Ecotourism is another sustainable use of these wild places. For example a scarlet parrot taken from the forest can be sold for \$1,000, but tourists will come for years and spend many thousands to see the birds if they are left in the wild.

Cocoa can be sustainably produced in the rainforest, and there is a search on for lowfat chocolate. Crude palm oil is very high in tocotrienol (potent source of vitamin E activity) and beta carotene. **Portulacca or purslane** is also high in these, plus lowers cholesterol. Brazil nut is best source of selenium, with 70 mcg compared to the daily requirement of 60 mcg. **Camu camu is the richest source of ascorbic acid per gram of fruit.** Dr. Duke is helping a company find a eco-conscious ski wax. The ivory palm bears a juice, and is edible, but also produces a substance so hard it is referred to as vegetable ivory, now becoming valuable as a substitute for elephant ivory. U.S. imports \$1 million/month of senna and \$2 million in psyllium as laxatives.

Politics are sometimes important determinants of sourcing. For years most ipecac came from

Nicaragua, then shifted to Peru because of politics, then back to Nicaragua. Licorice and ephedra have come from various sources too. Ephedrine is 2/3 synthetic, 1/3 extracted from Chinese Ephedra.

Reserpine, a tranquilizer was mostly imported from India, it became endangered, so sourcing shifted to Africa. Now it is about the same cost to synthesize as to extract, so the cost of energy determines which is used.

Pulegone is an insect and bird repellent. **Capsaicin** is used for both criminal deterrent and bear repellent. **Sesame** is a good source of tryptophan.

On July 20, 1994, The Wall Street Journal carried a story about sesame, evening primrose and winged bean seed having substantial amounts, ~ 5,000 ppm of tryptophan, which has been shown to increase serotonin. This brain chemical may affect satiety and help with weight loss. It is also a sleeping aid.

- Walnut has up to 300 ppm serotonin.
- Rosemary oil, as used in shampoo, contains pulegone which can reduce risk of Alzheimer's disease.

Dr. Duke offered participants a copy of a list of plant compounds from the Sigma catalog giving prices.

Duke was asked about the difference between taking individual chemicals from plants and using them medicinally, and using the plants themselves. He pointed out that Periwinkle, grown in Madagascar, has approximately 600 alkaloids, many of which are or may be used in antitumor medicines. Likewise, many plants, including Taxus (source of taxol) have compounds which may work in synergy with others. Dr. Duke believes, after years of first doubting but much study, that synergy in medicinal effect "is the rule rather than the exception".

A high point of Jim Duke's presentations was a look at part of his awesome slide collection of beautiful plant and rainforest photos, bits of scientific literature, resource information, and humorous illustrations. He described the tools of the trade for some traditional healers, and described his ecotourism program in Peru, through which tourists and now pharmacists and doctors are taught the value of medicinal plants. They also see native crafts being made, which they can then buy, and learn that construction. Best of all, they gain a respect for the forest and reverence for nature.

He showed dozens of plants with useful properties, from fava beans (contain l-dopa) 16 oz of beans or 1.6 oz of sprouted beans would contain enough of the compound to be useful for Parkinson's disease. **Lupine** contains a compound genistine which can prevent formation of new blood vessels which supply tumors (breast and prostate especially).

Kudzu has now been documented effective in treating alcoholism (in hamsters). It also contains genestine.

Rotenone, a natural insecticide and repellent may also be important to Africa. He showed the

treatment of ringworm with a natural latex.

September 15, 1994

PARTICIPANT PRESENTATIONS

On this, the final day of the Workshop, participants presented plans they had developed.

The first group developed a plan for developing an essential oil and spice business. They used the Commodity Systems problem solving approach, calling upon personal experiences and assistance from resource people. They identified the problems in such a venture, including financial, access to technology, lack of information, secrecy of the industry and others.

They also identified the potential benefits of the venture; low-input crops with relatively high value, fertility of the land and availability of water, favorable labor rates and others. They identified resources and a strategy for organizing to approach financial institutions and the Farmers' Union. After identifying potential pitfalls in production and marketing, the group discussed training programs and the steps they would take in developing production, processing, collection centers, transportation and even consumer education. Zambian cuisine uses practically no spices, even chilies, so they would plan to encourage the use of culinary herbs and spices, while also pursuing regional and export markets. They would attend trade fairs, and utilize institutions including the University of Zimbabwe, SACCAR and others. For funding, they would pool resources from their membership, seek donations for R&D, apply service charges (levies) on sales, and seek loans.

After the participant's presentation, others in the group provided feedback about strengths and problems with the proposal. One particular strength of the proposal was the suggestion of using University of Zimbabwe rather than duplicating efforts. Because of the former Confederation, that university has a regional herbarium which covers at least three of the countries in the region. Several participants weighed the virtues of working with existing associations, some of which have been secretive and self-protective. It may be wise to also develop a local group.

Another group actually organized as if they were starting a new company, each taking a management position, and discussed how they would increase the market for soya oil.

The third presentation was a detailed look at the maize market and made a case for a new maize trading company, despite the fact that the crop is heavily managed by the government. The liberalization of maize marketing has created a market opportunity which did not exist before.

One of the most impressive features of this, the last day of the Workshop, was that the participants responded to each others' presentations, pointing out inconsistencies in the plans, offering personal experiences and highlighting problems and solutions ranging from production issues to marketing, financing and governmental policy, regional competition and cooperation. The Workshop participants have truly become their own resource pool. There is now talk among the participants of organizing into an association to help each other utilize what they have learned to advance their existing businesses or develop new ones.

Two groups focused on medicinal plants. The first had little knowledge of the subject, but used resource people effectively. They began by looking at the Zambian pharmacy to see what medicinal

plant products were present. They found none locally, then evaluated two approaches: one high-tech, suggested by a Professor of Pharmacognosy, but was deemed too capital intensive to enter. The other was the use of simple extracts with minimal equipment, suggested by Rob McCaleb.

They considered ginger extract for anti-nausea use, in pregnancy or even AIDS, and guava leaves as an antidiarrheal. Appetite stimulants were also considered, based on classic ingredients of bitters, like gentian root. They figured the cost of getting into such a business would only be around 50,000 Kwacha, and could make their first batch of ginger medicine for around 9,000 kwacha, a combined cost of less than U.S. \$100. In this way, they could test the market without much capital expense.

As resources they would consult the Traditional Healers Association, and the University of Zimbabwe, and the herbarium there. This group expressed great admiration for Dr. Duke, who brought as a handout for his presentation, a whole book about medicinal plants for Zambia. They would contact Shaman Pharmaceuticals, a company suggested by Dr. Duke, and also the World Health Organization. Financing is not considered a problem, because of the low cost of entering the market. Asked how they would expand into the regional market, they were unsure, preferring to start small, and see if regional demand would follow. Additionally, they realized that a successful initial test market showing profitability would make it easier to approach financial institutions for capital to expand.

The last of the groups also focused on medicinal plants. This group, however included an organic herb grower, a pharmacist, a traditional healer and a cosmetician and marketer. They assessed the market, using information provided by Mr. McCaleb and others, showing a growing international market already over \$10 billion in a diversity of herbal products.

This group prepared a thorough demonstration of the business issues and strategy they had developed for a medicinal plant venture. It is reproduced here, as written by Ian McLean.

REGIONAL MARKETING STRATEGY FOR MEDICINAL PLANTS

Group 4 Members:

Temba Gxotiwe
Barbara Manjoro
Ian McLean
Mukumbuta Njekwa
Gladys Ramabulana - resource person
Don Lindemann - resource person

INTRODUCTION

1. The AGRO-INDUSTRIAL WORKSHOP has confirmed the potential for medicinal plants as marketable commodities for domestic and international markets. In addition, the capacity exists, albeit in its infancy, to create meaningful opportunities for micro, small and medium agro-industrial enterprises.
2. Given the market opportunities and the inherent capacity of the Region to create a viable and flourishing medicinal plant industry, the missing ingredient is the catalyst required to give

life to the project. Clearly, the **Zambian Workshop** has been able to create the atmosphere for co-operation and insill a determination to regionalize the efforts in order to be competitive in the demanding markets, both locally and abroad.

3. A number of issues will be addressed in this brief proposal for a "Regional Marketing Strategy"
- 3.1 The Market
- 3.2 The Constraints to the Establishment of a Medicinal Plant Industry
- 3.3 Creating the Mechanism for Coordination and Growth through the Commodity Marketing Systems Approach to Facilitating Development
- 3.4 Available Regional Technology
- 3.5 Relevant Institutions
- 3.6 Funding
- 3.7 Identification of Skilled Resources and Management
- 3.8 Strategic Mission

THE MARKET

4. The World Retail Market for herbal products is approximately US\$ 20 Billion. The wholesale market is approxiniately 50% of the retail market, US\$ 10 Billion. The North American market is approximately 10% of world retail, namely US\$ 2 Billion.
5. Growth rates vary reflecting the stage of development of the herbal market in Europe and the Americas or changes in the socio-political and economic environments as in the case of an emerging Southern Africa, particularly South Africa. Growth rates are approximately :

United States	12 - 18% per annum
Europe and Asia	10% per annum
Africa(Traditional African)	30% per annum

THE CONSTRAINTS

6. With the enormous and growing potential market, and the opportunities for diversification and job creation in Southern Africa, it seems strange that there has not been more progress towards the establishment of an herb industry in the Southern African Region.
- 6.1 There are a number of constraints that have been identified. These include :
- 6.2 Lack of Access to Markets. Not only are large markets difficult to access, the quality standards and volume requirements of these markets puts the grower out of reach of these opportunities

- 6.3 **Limited Number of Growers.** There is only a fledgling herb industry in Southern Africa. The sparsity of "commercial" growers coupled with the absence of appropriate organized processing and distribution compounds this problem.
- 6.4 **Inadequate Knowledge and Insufficient Information.** In addition to a lack of information and knowledge on the growing of herbs, knowledge of organic farming methods (as required by the organic farming certification bodies) is inadequate.
- 6.5 **Unconsidered Alternative.** Emphasis on other cash crops has overshadowed the emergence of significant niche-market cash crops. Coupled with a lack of knowledge of medicinal plants/herbs and the markets for these products, the lack of interest in herb diversification is understandable.
- 6.6 **Insufficient Seed and Seedling stock.** Lack of demand is part of this problem.
- 6.7 **Lack of Processing and Service Facilities.** There are very few facilities available for bulk processing of herbs in Southern Africa.
- 6.8 **Under-developed Market Awareness.** This applies equally to the nature of the products and the nature of the consumer.
- 6.9 **Lack of Co-operation.** Given the nature of medicinal herb growing, processing requirements and expected customer's quality levels, the lack of co-operation and co-ordination is perhaps the most serious constraint to progress. This is especially true now that Southern Africa is entering a new era of (hopefully) peace and growing prosperity.

CREATING THE MECHANISM FOR COORDINATION AND GROWTH

- 7. Clearly what is needed is a great effort to co-ordinate and promote the development of a "Southern African Medicinal Plant Industry". The Industry has significant potential and could easily rival the value of other major crops in the future.
- 8. A review of the Commodity Marketing Systems approach is invaluable in determining the components necessary for the coordination and growth of this industry. Components for a so-called Integrated Herb Production Scheme include the following, not listed in any particular priority:
 - 8.1 Local and International Markets
 - 8.2 Growers, typically small scale farmers
 - 8.3 Seeds and Seedlings
 - 8.4 Processing facilities, including drying and distillation among others
 - 8.5 Support and Extension Services
 - 8.6 Warehousing

- 8.7 **Public Sector involvement**
 - 8.8 **Laboratory and Test Facilities**
 - 8.9 **Quality Control Systems and Facilities**
 - 8.10 **Transportation**
 - 8.11 **Relevant Institutions**
 - 8.12 **Information Storage and Retrieval**
 - 8.13 **Electronic Trading and General Computing Competency**
 - 8.14 **Training and Education facilities**
 - 8.15 **Forums and Associations**
 - 8.16 **Insurance Facilities**
 - 8.17 **Printing and Publishing**
 - 8.18 **Organic Farming Supplies**
 - 8.19 **Organic Certification**
 - 8.20 **General Equipment Suppliers**
 - 8.21 **Marketing Organizations, Brokers and Agents**
 - 8.22 **Packaging, encompassing all aspects from lugs to retail**
 - 8.23 **Business Support Organizations**
 - 8.24 **Legal**
 - 8.25 **Accounting Services**
 - 8.26 **Medicinal Plants (Herb) Commodity Exchange**
 - 8.27 **Advisory Services**
 - 8.28 **Funding Mechanisms and Resources and others.**
9. **An underlying philosophy will require that as much value-added should be made in the Region, prior to export. Quality will be the responsibility of all those involved directly with the product. Much reliance will be placed on the growers and early-stage processors to**

produce quality products for further enhancement.

10. The term "Herb Production Co-operative" is not an adequate description for envisaged decentralized growing and processing units located around the region but perhaps gives a conceptual understanding of the implementation strategy.

The objective is for the "Herb Production Co-operatives or Units" will be able to process to a reasonable degree of sophistication. More sophisticated processing will take place at locations that are positioned so as to minimize costs while maximizing utilization of existing facilities in various countries in the Region.

TECHNOLOGY

12. Considerable investigation has been made into appropriate technology. Organic Farming requires minimum or no use of chemicals, is more suited to small scale farms and benefits from permaculture and sustainable farming practices. The input costs should be lower than for so-called "conventional" farming.
13. "Appropriate technology" will range from the use of draft animals to solar energy, from hand-tools to advanced processing equipment. The region is well-endowed with organizations within the public and private sectors capable of providing the necessary technology at varying levels. Co-ordination of resources and research will be important.

RELEVANT INSTITUTIONS

14. The often turbulent/divided history has had an important impact on the institutional environment. The region is well-served by a number of similar organizations in each country, including scientific and industrial research, botanical resource centers, agricultural development, bureaus of standards and others. In addition to these kind of organizations, there is a plethora of other organizations (banking, service, etc.) that have relevance to the establishment of a regional medicinal herb project.
15. Once again, co-ordination of all these institutional resources is fundamental to the strategy. There is no shortage of expertise. It needs to be channelled and utilized efficiently. If necessary, new or modified institutional support may be required, for example the establishment of a Medicinal Herb Foundation.

FUNDING

16. While the amount of funding required will be relatively significant, the process itself will be straight forward. Several key issues will be given great importance within the context of the entire scheme. A primary objective is the promotion of small and medium enterprises and job creation, with stated goal to create long-term, profitable growth.
17. It is envisaged that wherever possible (and this would apply in most cases), small business would provide the support to the project. In each such case, the entrepreneur, with assistance as necessary from the Management/Business Support organizations and individuals, would produce a thorough business plan and be assisted in raising the necessary start-up funding for his supporting enterprise.

18. In the unfriendly lending environment, it may be necessary to establish alternative banking-lending facilities as well as Agro-industrial venture capital funds. The underlying principle is to establish profitable and well managed firms at whatever level.

SKILLS

19. The creation of a Regional Integrated Herb Production Scheme and all its components will have important implications for skilled labor and management. Education and training will be extremely important components of the entire project.

STRATEGIC MISSION

20. The Strategic Mission for the project is to :

"Establish an international, integrated organic herb-growing project which would include an array of supporting organizations and services, preferably small scale enterprises including the growers, optimally combined to achieve profitable sales in domestic and export markets for indigenous and non-indigenous herbs and herb-related products.

Conclusion of September 15 session.

This was a good representation of the participant presentations, and demonstrates a good integration of the workshop content with the experience of the participants. This is an eloquent assessment of the quality of the workshop and its participants, the business planning, quality management, marketing and networking aspects of the program are all evident in this document.

SUMMARY

All of the participants brought a high degree of enthusiasm and talent to the workshop, and left with dozens of documents from presenters and USAID. More importantly, they left with a better understanding of how to think of themselves as agribusiness companies, using planning, marketing strategy and access to resources to increase their chance of success, and their profitability. Each has become a resource for the others and they came to see interdependence as a key to their growth.

GRADUATION

A closing ceremony included presentation of certificates to the participants.

FOLLOW-UP

After the closing, most participants reconvened and established a group to follow up on the workshop. The group will meet in Zimbabwe on Oct 15. The group is to be called the Southern Africa Herb, Spice and Essential Oils Association. It will have 3 representatives from each of the four countries involved; Zambia, Zimbabwe, South Africa and Malawi. The enthusiasm generated by the workshop was evident in this founding meeting of the Association. All workshop participants are committed to maintaining contact and momentum, and helping each other to develop the market throughout the region.

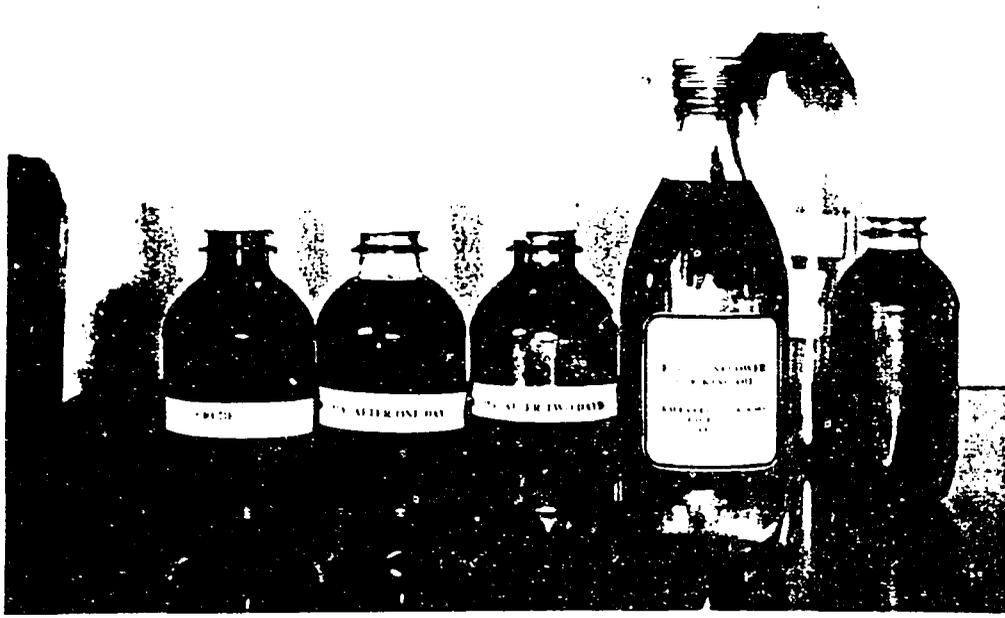
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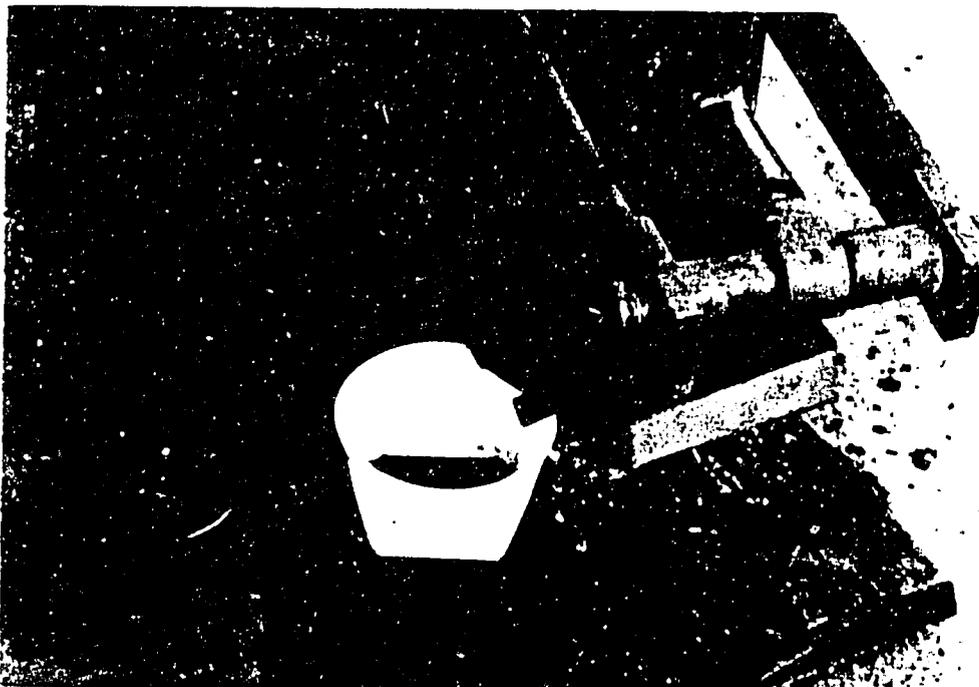
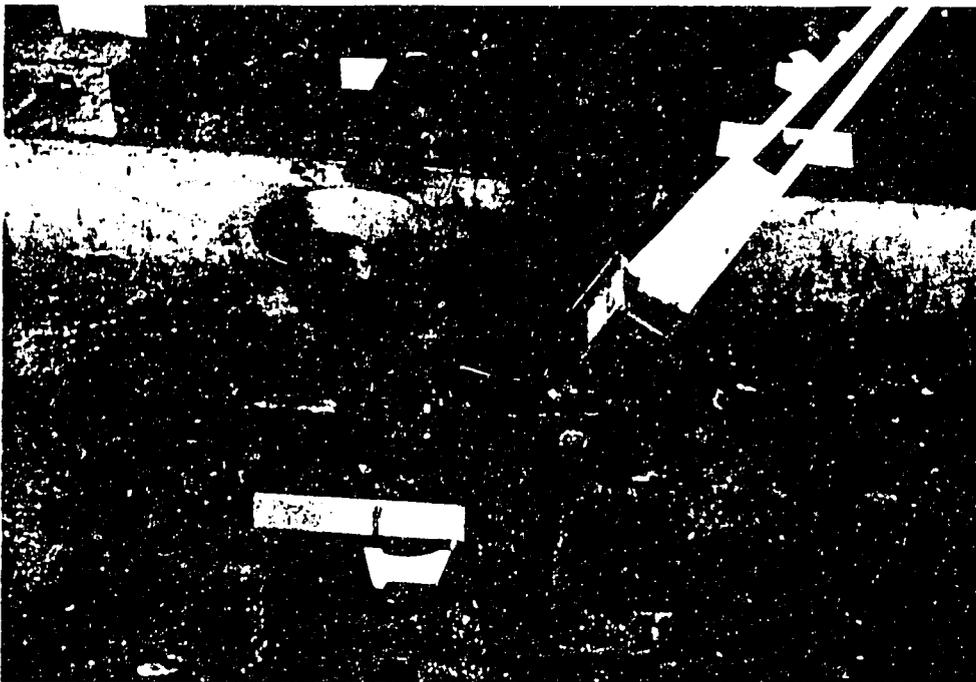
Africare

OILSEEDS

Africare is a major American NGO working in Africa exclusively. Mainly, they have been involved in agriculture. They receive proposals from villages, and send people to assist directly, and help to identify local resources.

They have taken a sesame seed project, and conducting trials on seed from surrounding countries, and within Zambia. Africare has also worked to acquire ram presses to form nuclei for the production of oilseeds within an area. There are currently over 100 ram presses in operation in this program, and the results will be known within about one year.

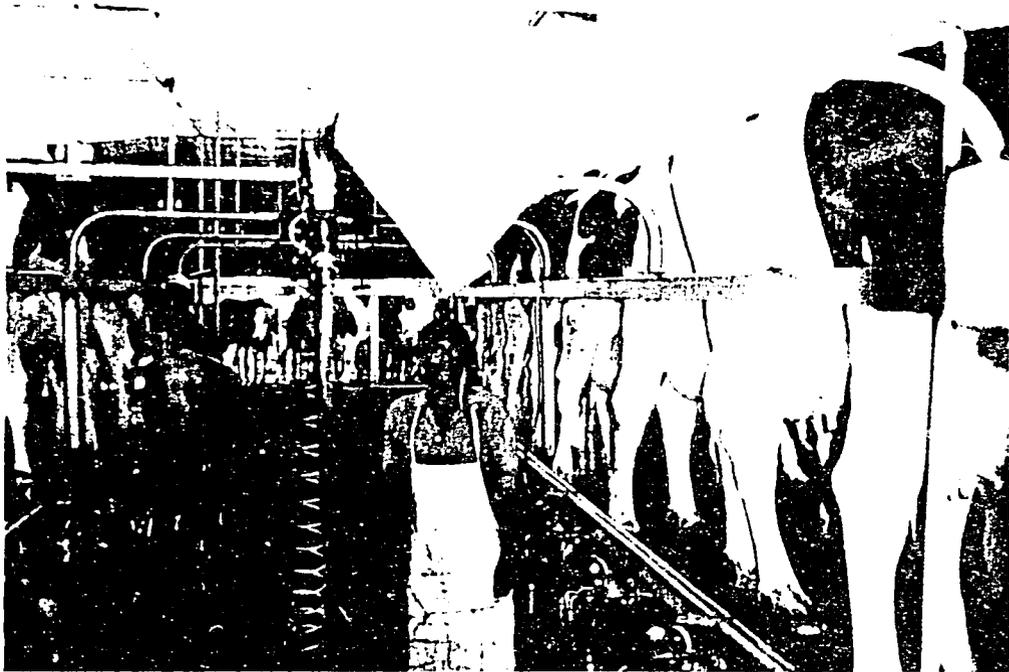
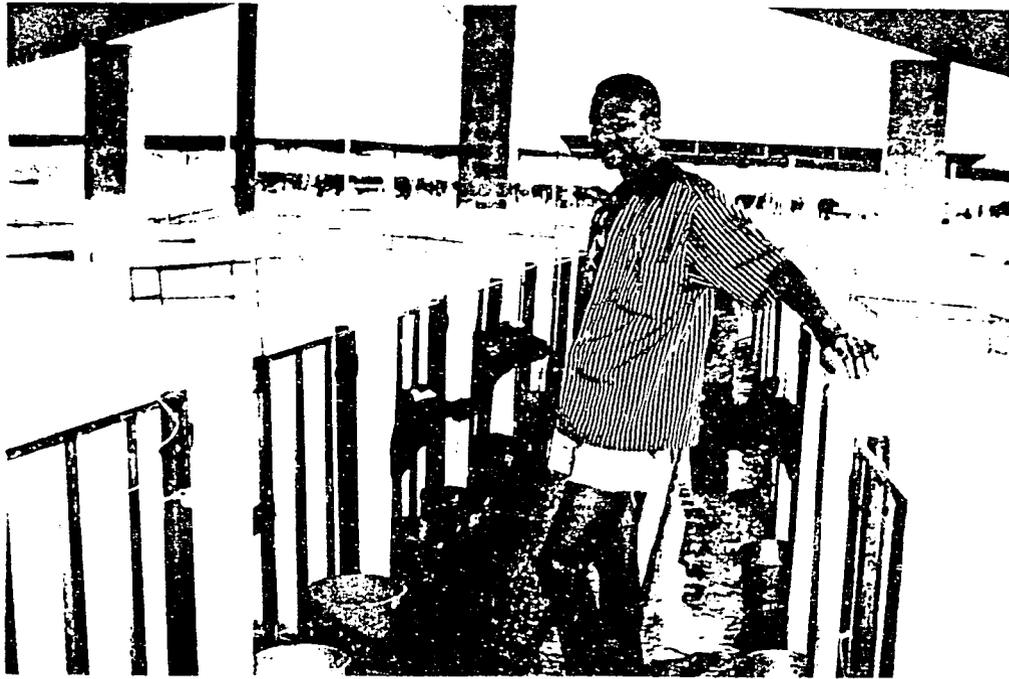


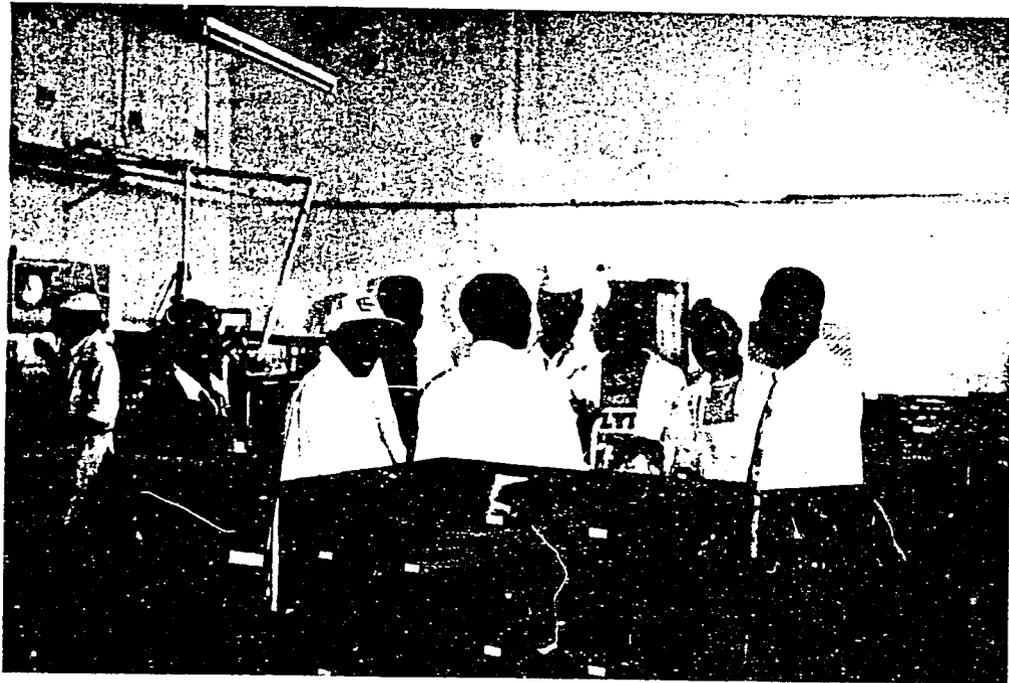


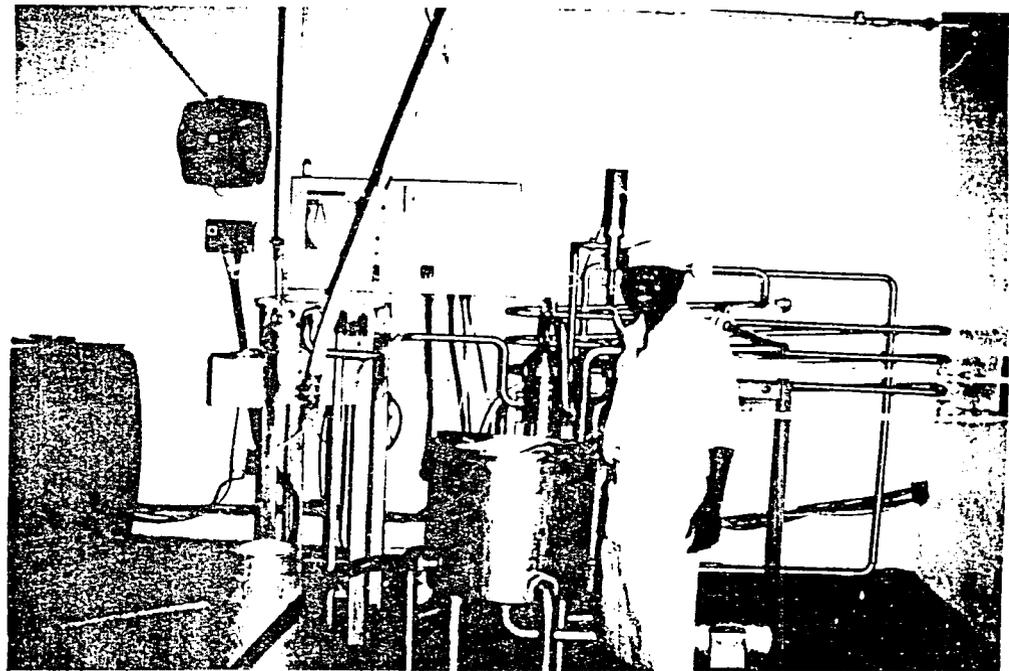
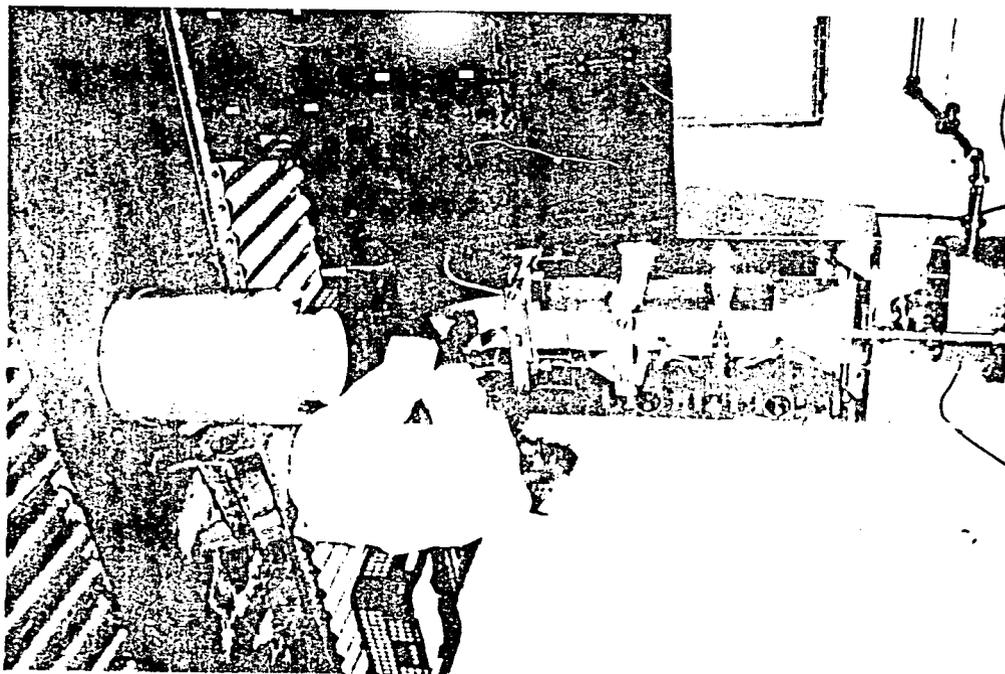
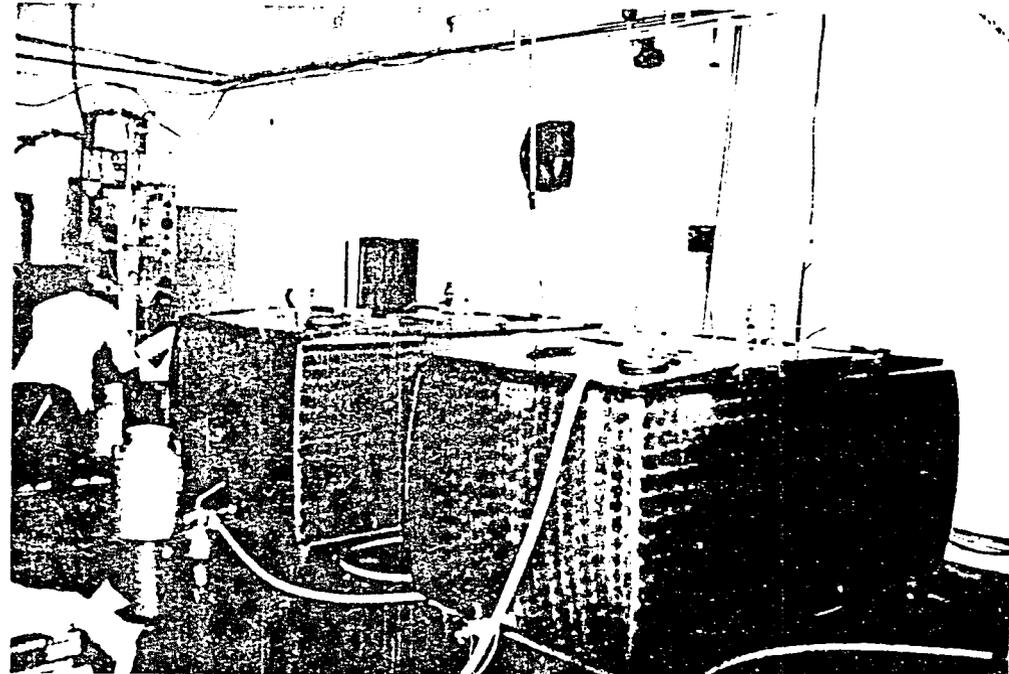
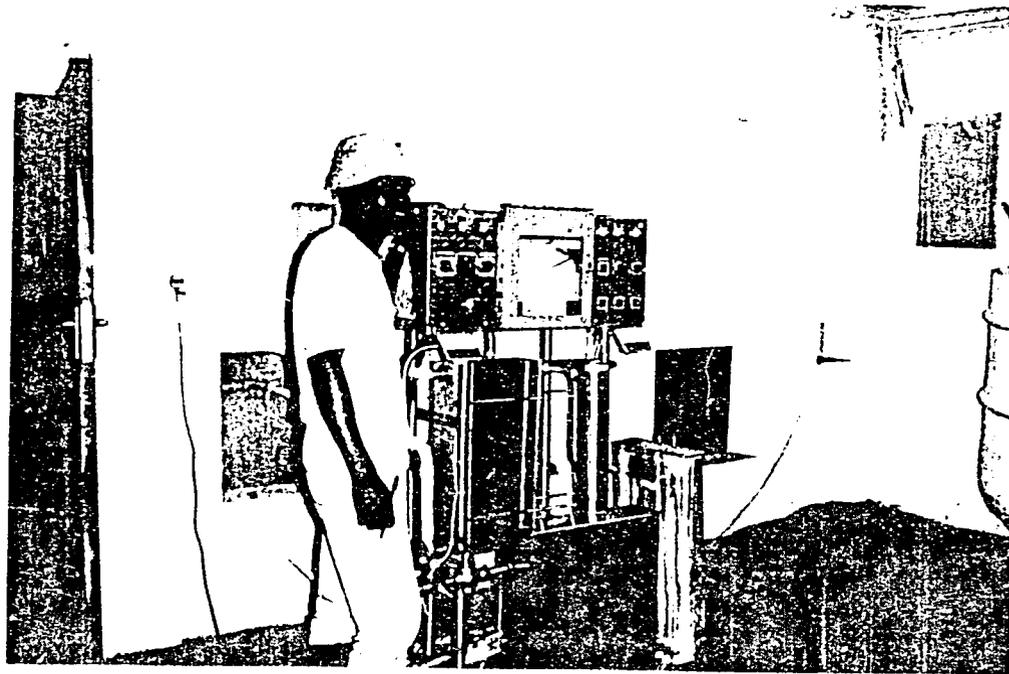
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NGYU Dairy



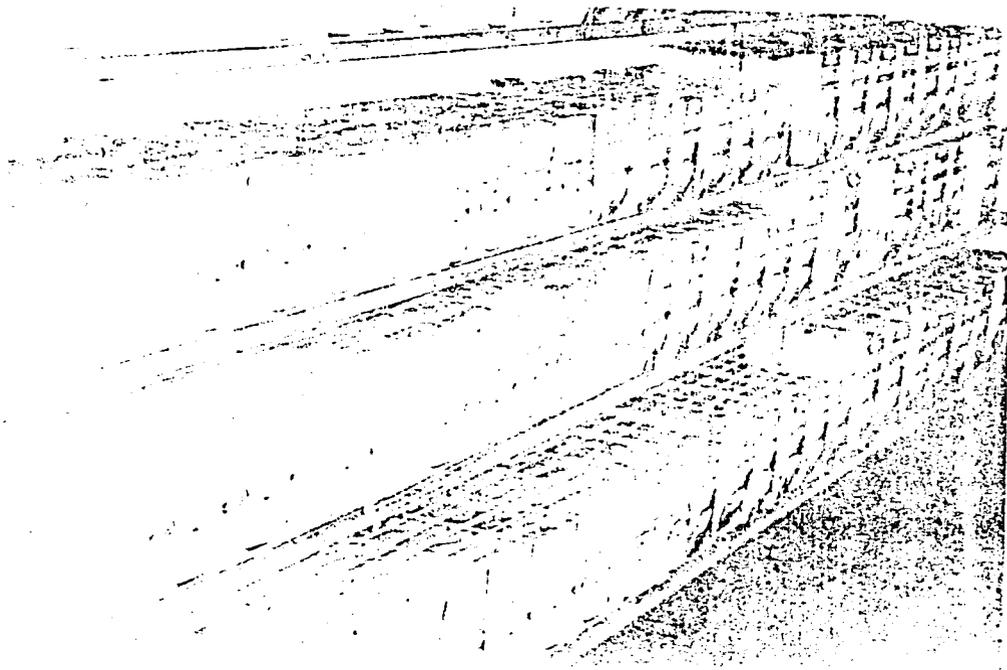
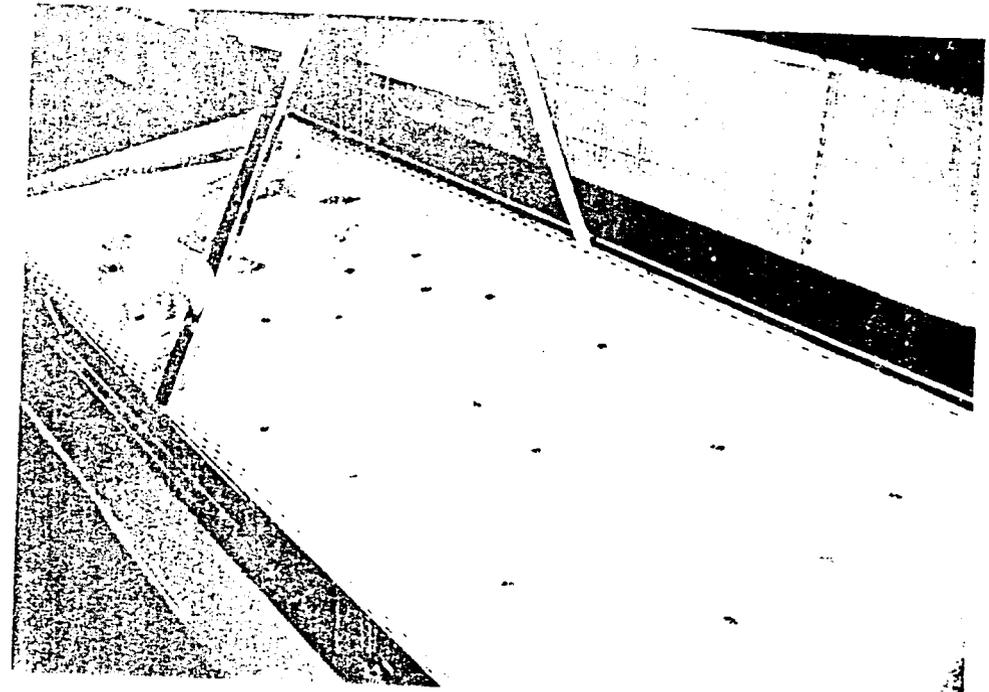


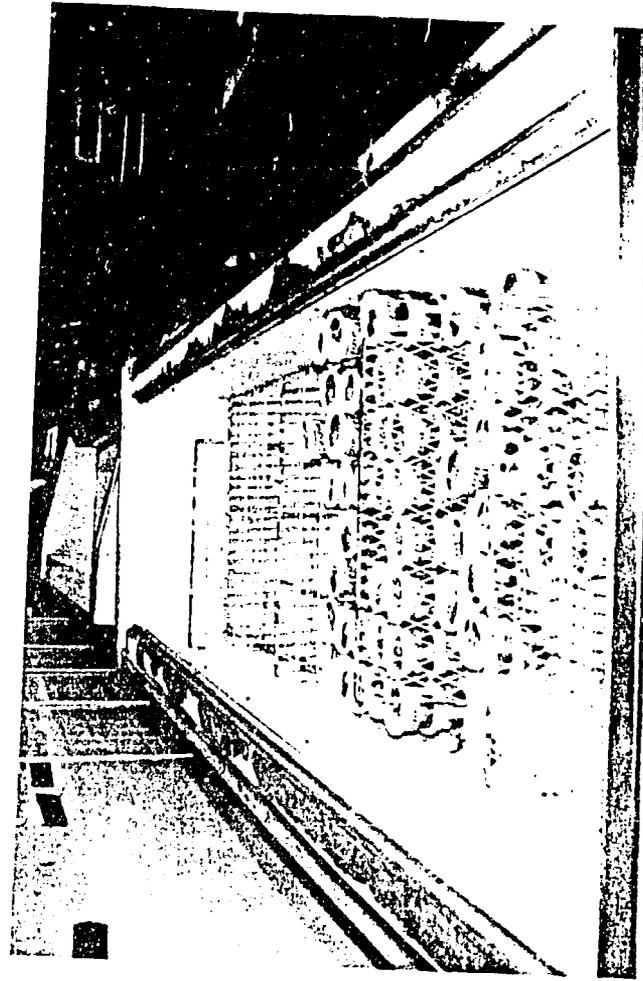
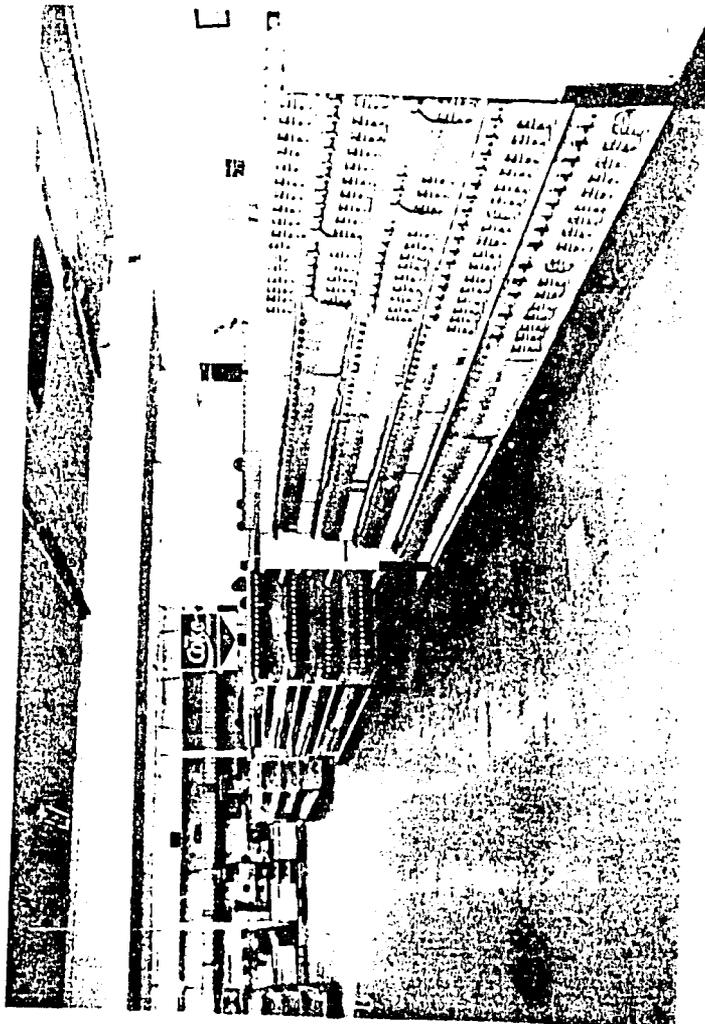
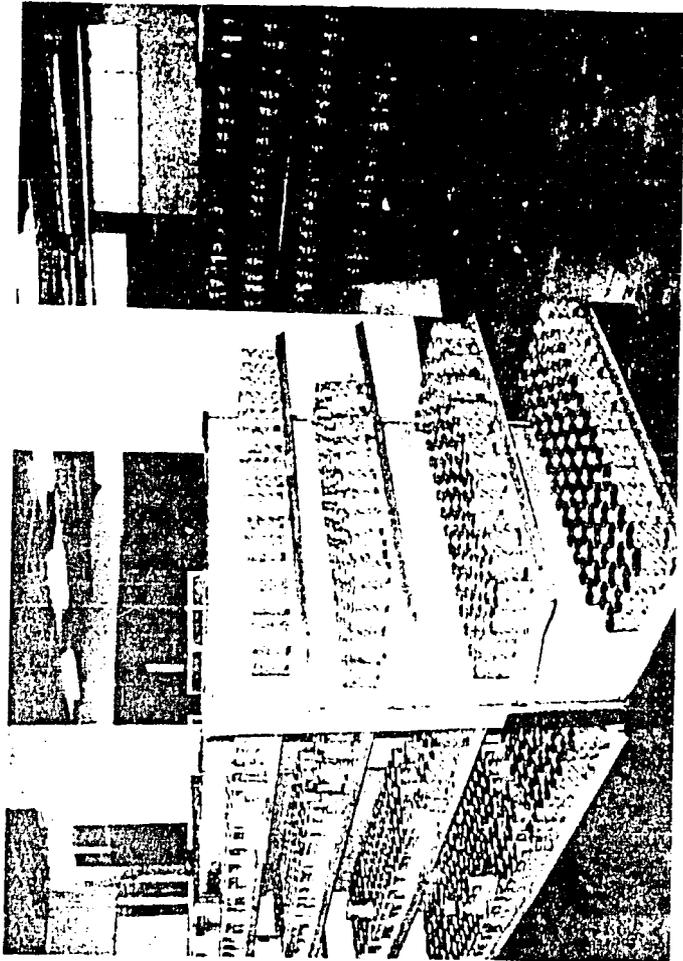
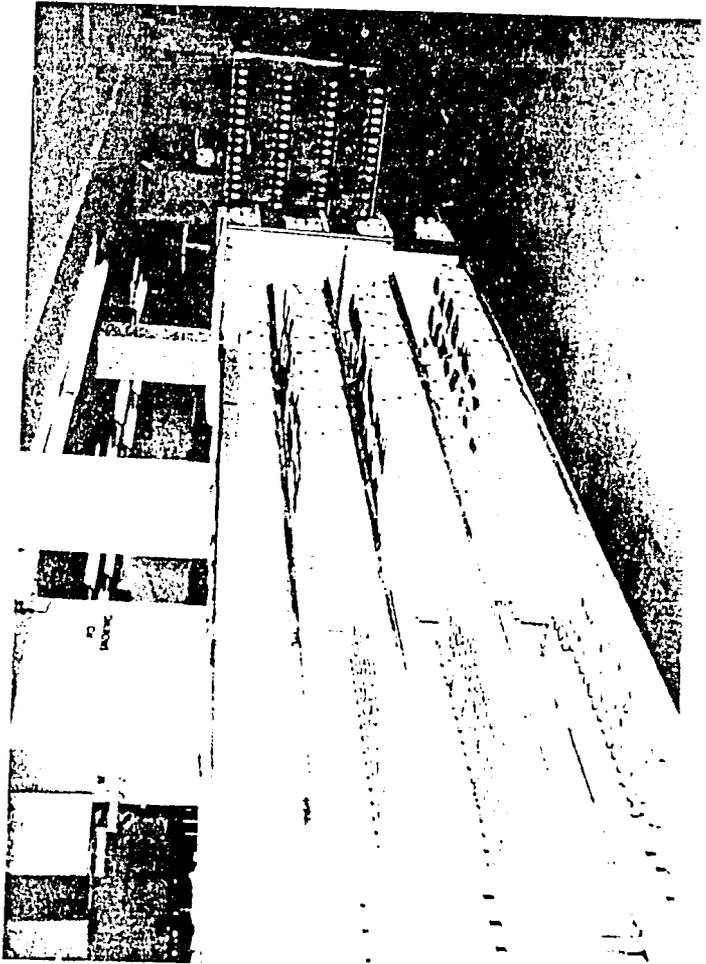




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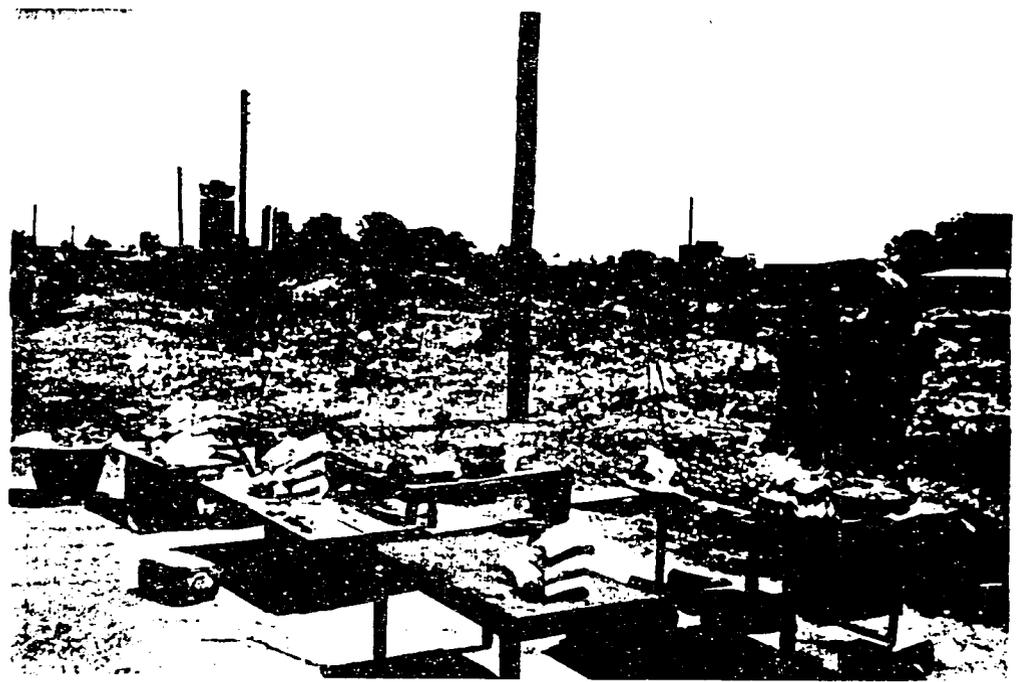
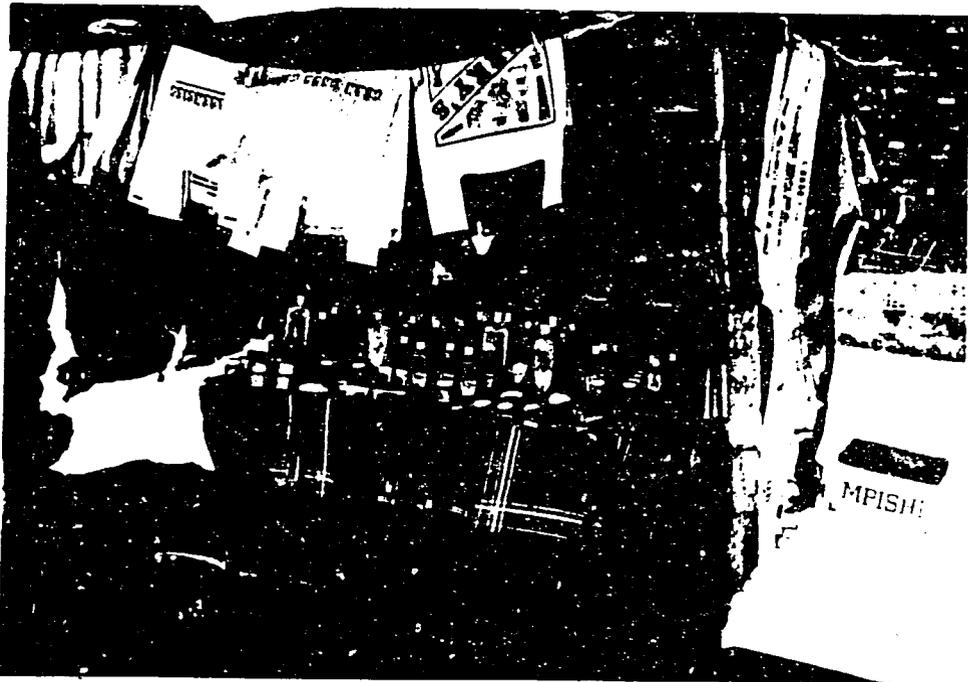
Visit to Retail Outlets





ATTACHMENT 4

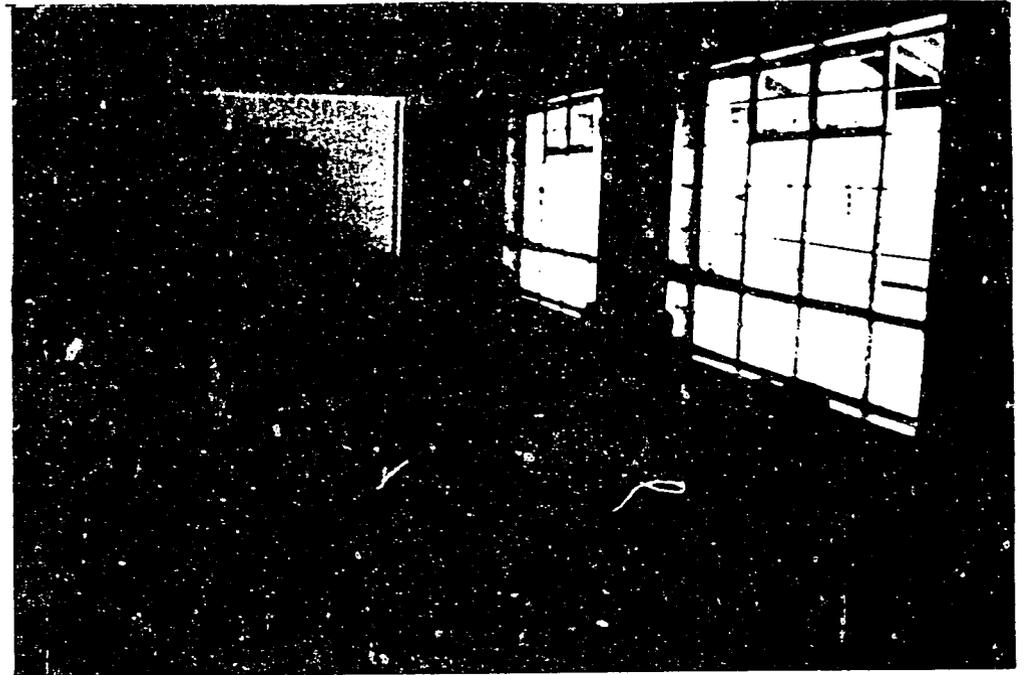
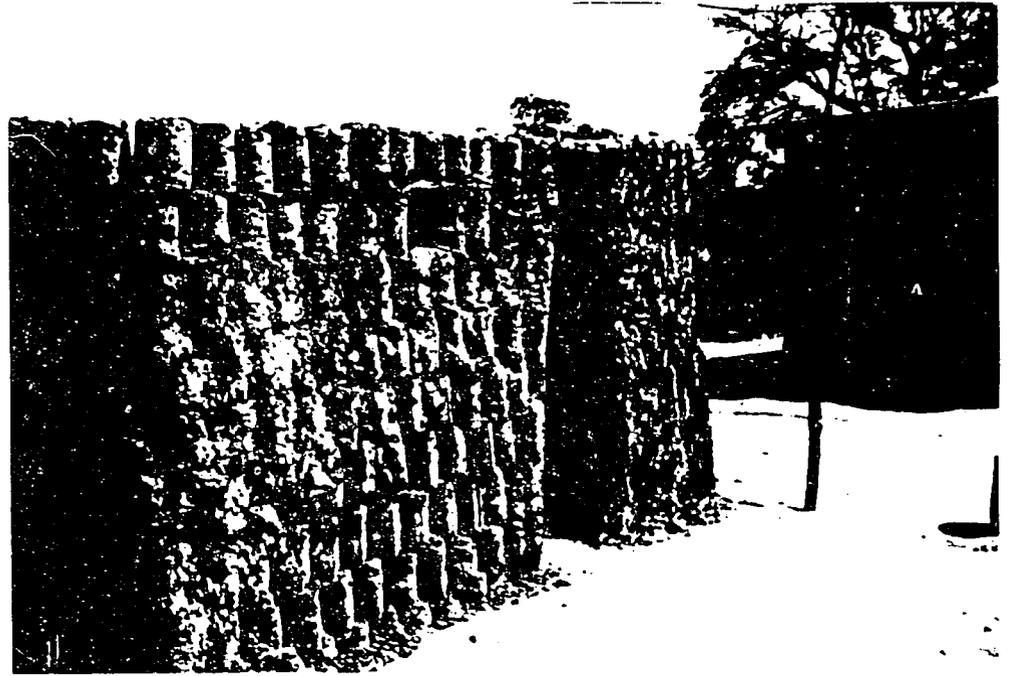
Visit to Open Market

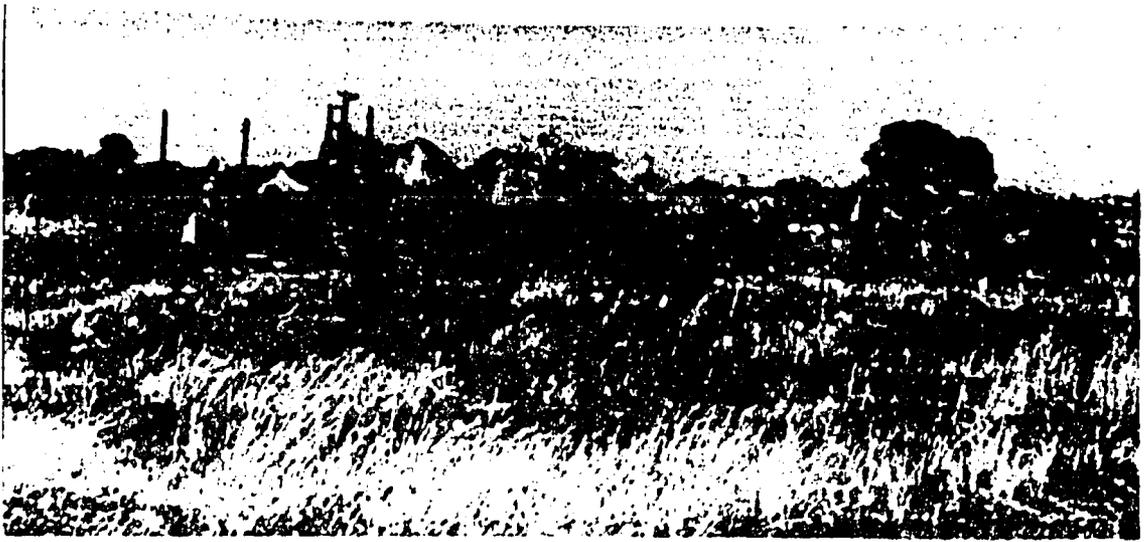




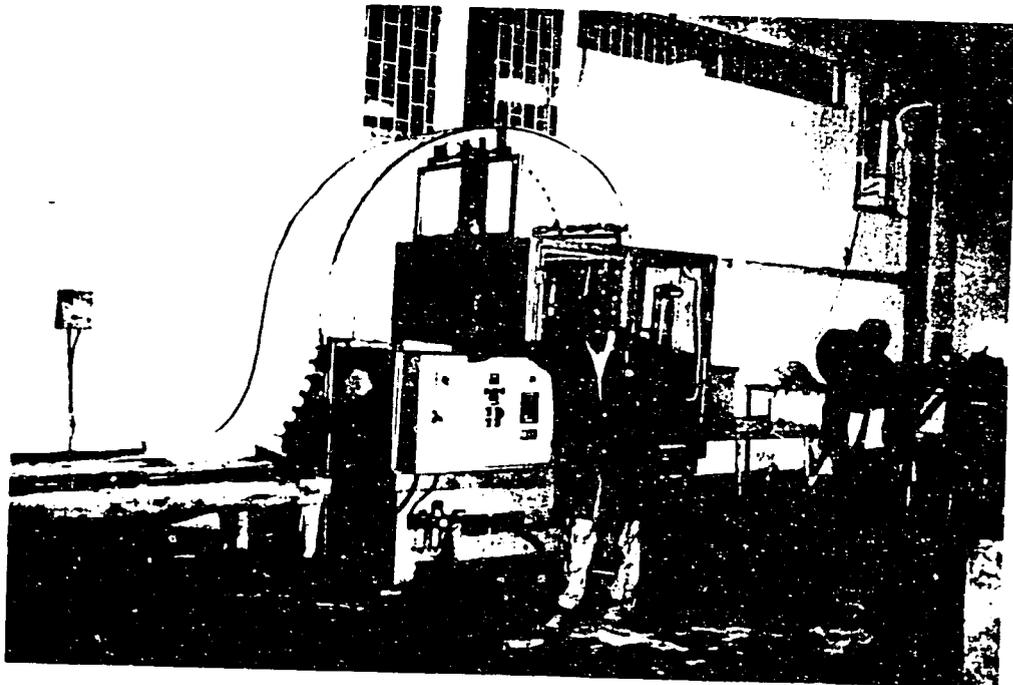
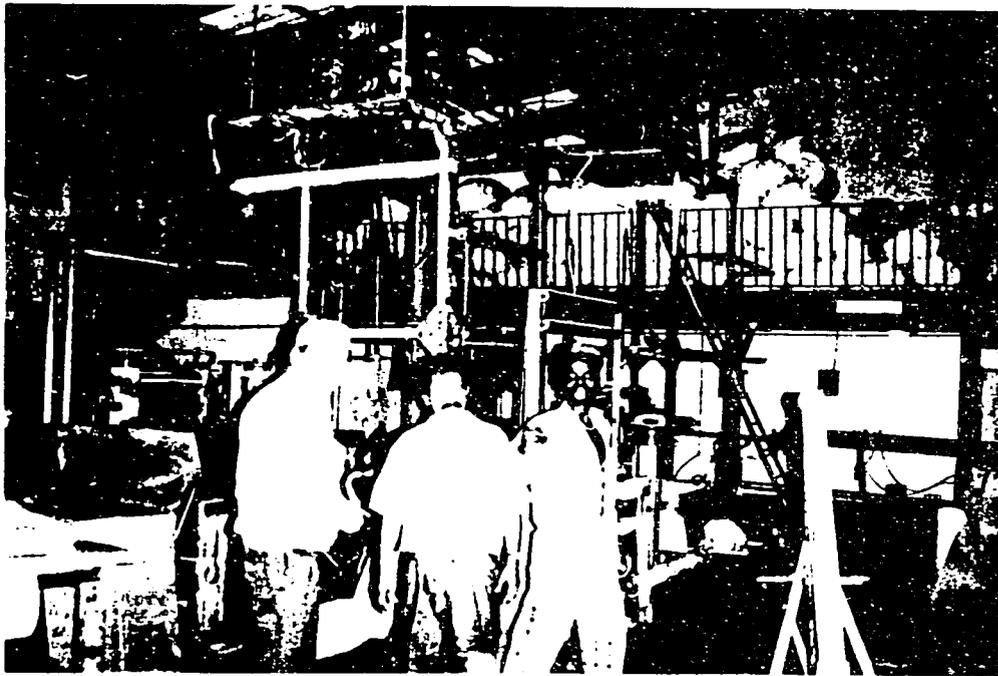
ATTACHMENT 5

Homes and People in Rural Areas





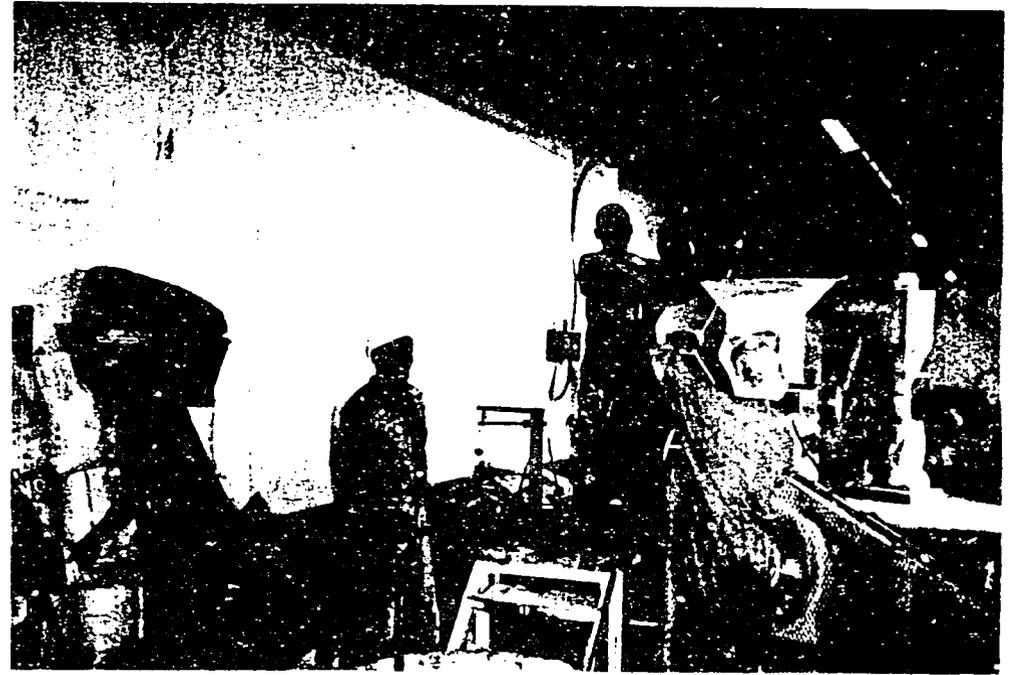
ATTACHMENT 6
Plastics Blow Molder





ATTACHMENT 7

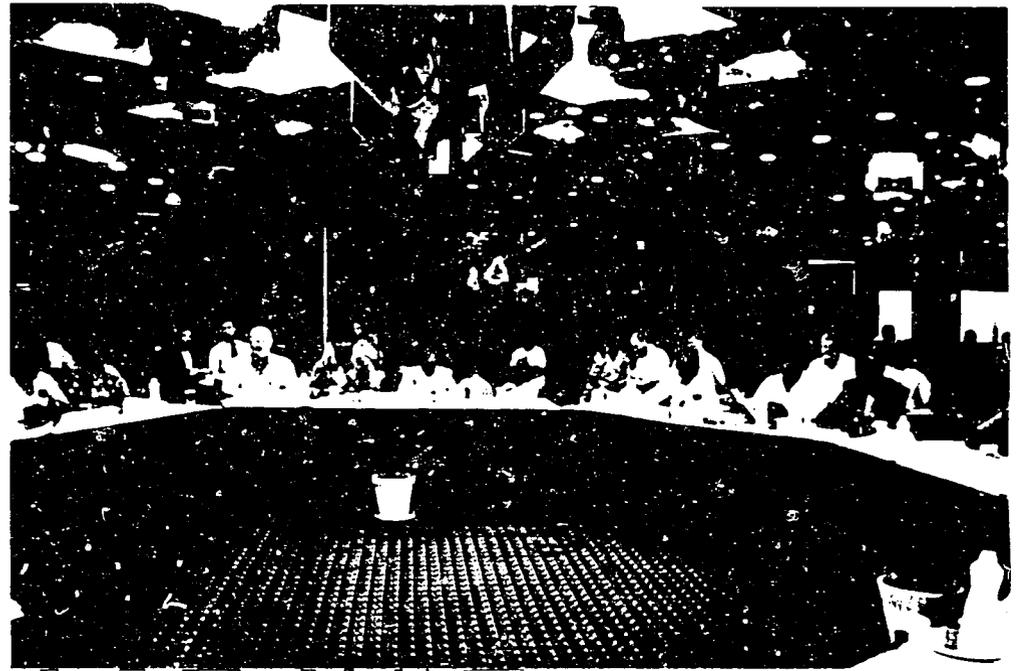
Grainery and Water Bottler





ATTACHMENT 8

The Participants

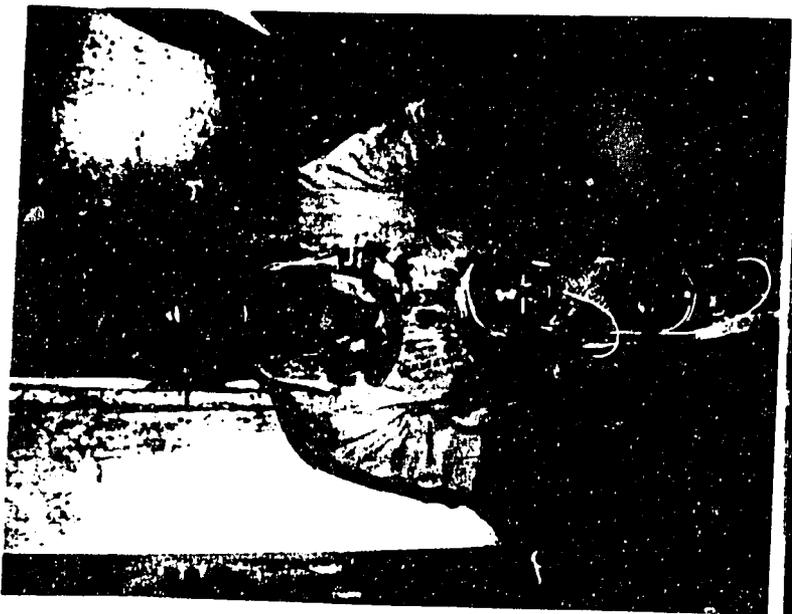






ATTACHMENT 9

The Witch Doctor



ATTACHMENT 10

Victoria Falls



ATTACHMENT 11
Detailed Packaging Presentation

NOTES
from
PACKAGING WORKSHOP

PROJECT
SUSTAIN
IN
ZAMBIA

SEPT. 5, 1994 - SEPT. 16, 1994

Export Issues

General Information:

If a Package is intended for use outside the country of origin, there is a host of special problems. The hazards of transportation are greater when you go beyond local truck or rail movement. Goods are often handled with slings off and on ships and sometimes cargo has to be hand transferred to lighters or flat bottomed barges before being transferred to dockside. The more handling by hand the greater the opportunity for damage and pilferage. There is a growing use of large cargo containers which greatly simplifies the packaging problems, but unless you are assured that containerization will be used for your cargo, the package should be designed to be 1-1/2 to 2 times as strong as needed for the local market. Single wall corrugated shippers for example are usually increased to double or triple wall shippers. In some cases wooden containers are substituted for corrugated shippers. Textile bags will sometimes replace multi-wall paper bags.

Markings and decorations become more complex, and the laws, customs and traditions in foreign markets are pitfalls for the uninitiated package designer. Certain words can become completely unacceptable when they are translated into another language and some colors have special significance in other lands. Purple for example has a negative connotation in Argentina and Italy. Gold and Red are honored colors in China but are avoided in the middle east. Yellow is an unlucky color in China. Black and Gold are colors often used in the US to denote high quality but in many parts of the world black implies death. In some countries certain colors are actually illegal.

The numbers 4 & 9 are unlucky in Japan. The number 13 is unlucky in the United States. The number 14 is bad luck in Venezuela. Owls are cursed in Madagascar, and dogs and pigs should be avoided in Pakistan. Triangles are perceived negatively in Taiwan, Hong Kong and Korea but are popular in Columbia. The Land O' Lakes Indian Maiden used on all our products cannot be used without offending many in Saudi Arabia and other Muslim countries. (Use sample and discussion) Other examples of cultural sensitivities include Land O' Lakes Cheese products. A picture of a Cow on the package will be warmly accepted by a Swiss consumer and throughout many countries in Africa, but an Indian buyer would probably not buy a product that uses a cow as an icon. Pictures on the package without a clearly worded label describing the contents can often times be confusing and misinterpreted.

The package design is key to the success of your product in a foreign markets and the satisfaction of your potential customers. Even if you have the best brand in the market, you must consider whether the package will cause confusion or deter a sale.

It is of critical importance to know what an overseas customer wants and how they want it packaged. Container size or shape should be one that foreign customers prefer. For example, Japanese customers prefer small packages because they do not generally store food in their homes. Additionally, freezer space and storage display is limited in Japanese supermarkets.

Labelling information is critically important. Many countries require an expiration date to be printed on the label. In the US June 12, 1994 is listed as 6/12/94, but in many countries that date is listed as 12/6/94. The potential for confusion is obvious. It is important to know where to use the metric system or the English system when labelling the product quantity ie; liters or grams vs. ounces or pounds

Whenever possible it is very important to test the product in the foreign market before introducing a product in full scale production. If you have the opportunity to visit the country to which you wish to export be sure to visit the local markets and purchase as many competitive brands as necessary of the product you wish to export and carefully examine the packages being used. Try to find out which brands are most successful and why.

Cost of shipping a large "ship container" from the United States to Central African Ports is approximately \$6000.00.

Insuring goods is a complex issue. The answer to the question regarding what point the title to property actually passes from a seller to a buyer, especially in the case of lost or damaged products at any time in route seems to vary widely.

The answer however can be clearly spelled out in a well written "terms of sale document" Reference Marine Insurance book.

Additional Help:

There are 89 World Trade Centers around the world. The local University should have a listing of them.

There may be some local trade associations. Professionals involved in International Trade.

Private Consultants and Export Management Companies are costly, but available and usually help assure a successful export venture. A good one will act as your personal export department taking care of all the details. One measure of their quality may be their willingness to develop a Marketing Plan for your product as a first step in Export.

PACKAGING LAWS & REGULATIONS

NOTES:

Required for consumer protection

Historical Perspective

Ancient Arabian Merchants were certified by the bureau of standards by marking their measuring cups and bowls with an official seal. In Medieval England bread makers were controlled by laws on the sizes of bread made. Countless cases of products contamination with fillers and other ways of extending or cheapening a product brought reams of laws over the years to regulate.

In the US the Fair Packaging and Labelling Act was enacted in early 1960s which gave the Department of Commerce the authority to stop improper proliferation of package size, weights, measures or quantities. There are many provisions for example, any food that makes health claims on the package has to also list nutritive value in the product. With the introduction of the new nutritional values of all foods this requirement becomes redundant.

Some states require a deposit and return on beverage containers.

The laws created by the Federal Trade Commission is active in laws that address deceptive packaging and labelling as it relates to trade practices. The EPA (Environmental Protection Agency) has laws specifically dealing with pesticides, fertilizers and certain plastics. Department of Justice has laws dealing controlled substances and pharmaceuticals. The has laws regulating the distribution of packaged products and are especially concerned with hazardous products. They have jurisdiction on sea, land and air. other regulating bodies include:

The Consumer Product Safety Commission - Household goods
Children's products, flammable materials etc.

OSHA for Packaging Machinery and Plant Operations

Department of Agriculture which regulates fresh and processed meats and poultry

Postal service has regulations on mailable goods.

Food & Drug Administration has huge regulatory influence over Food, drugs, cosmetics, medical devices and public health.

Common carriers and rail services also have their own rules which a user must be aware of.

HAZARDS

TRANSPORTATION MODES

Marine

- Rolling, pitching, heaving, surging, swaying and yawing motions of ocean vessel
- Wave impact (water shipping over the bow impacting on deck stowed cargo or containers during heavy weather)
- Navigation exposures, sinking, stranding and collisions
- Temperature extremes resulting in heat or freeze damage

Rail

- Acceleration and deceleration
- Coupling impact during car humping operations
- Swaying on curves
- Shock and vibrations
- Derailments

Air

- Changes in atmospheric pressure and temperature
- Acceleration and deceleration forces
- Turbulence

Surface

- Braking and acceleration
- Coupling action and impact against loading docks
- Vehicular accidents (collisions, overturns)
- Shock and vibrations
- Road and weather conditions

Handling and Storage

- Rapid acceleration and deceleration during lifting and lowering
- Improper forklift operations

- Pushing and dragging cargo when inadequate material handling equipment or inexperienced labor is used
- Weight of superimposed packages
- Failure to keep stacks plumb
- Long term storage resulting in crushing of shipping package(s)

Water Damage

- Contact with rain, snow or sea water
- Defective intermodal container, or shipping package
- Condensation (ship/container or cargo sweat)
- Flooding (cargo stored on inadequately drained surface)
- Sprinkler discharge

Theft and Pilferage Hazards

- Hijacking of entire container and cargo
- Inadequate security measures at storage, staging or loading/discharge point
- Misrouting or non-delivery of cargo due to insufficient marks

Contamination

- Incompatible cargo stowed in the same hold or container
- Infestation
- Wildlife and rodents
- Insects
- Reptiles

Fire

- Ignition caused by friction, spontaneous combustion, external heat and/or chemical sources

• Smoke damage

CAUSES OF LOSS

The figures in the following presentation, while based on our own loss experience, are of a sufficiently large volume of claims to be considered generally representative of the industry.

Approximately 80 percent of all cargo losses are preventable. The prudent shipper recognizes that efforts in properly preparing, packing and marking shipments have a great influence on successful delivery of goods.

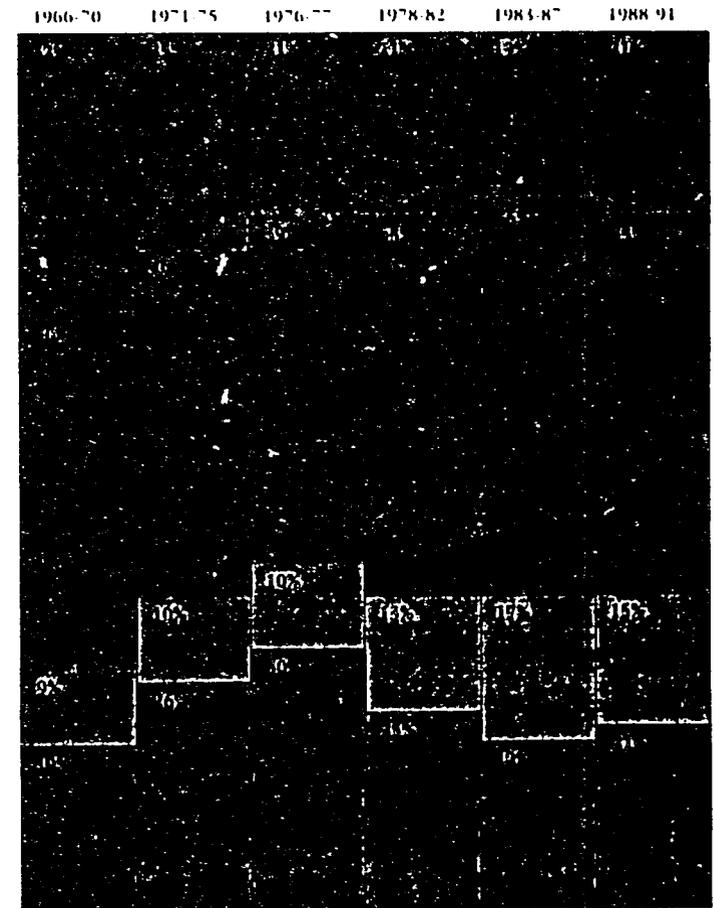
■ ■ ■ Preventable losses
■ Fortuitous losses

Theft
Pilferage and Non-Deliver

Handling & Stowage
Breakage, Leaking &
Crushing, Contamination
and Infestation

Water Damage
Fresh Water Condensation
("Sweat") and Sea Water

Fortuitous Losses
Sinking, Strandings, Fire,
Collisions and Heavy
Weather



Attention to the basic principles and techniques of export packing will help reduce the loss of cargo due to pilferage, minimize damage from improper handling/storage and protect against water damage.

Customer satisfaction and repeat orders are only two of the benefits that stem from a professional approach to cargo shipment. Reductions of time and money spent in tracing, locating and making adjustments on lost, damaged or pilfered goods contribute to a better bottom line.

BEST AVAILABLE DOCUMENT



PREVENTABLE LOSSES

Another critical component of cargo loss control is carrier selection. Services and facilities available to the shipper should include adequate cargo protection, modern equipment, clean stowage and fair claims policy.

Facts that explain why cargo is lost or damaged in transit are the most vital ingredients in judging carrier performance. The following pages suggest positive actions, within a shipper's control, which can be taken to reduce preventable losses. Beyond these actions, selecting carriers based on their performance is a necessary step.

Minimizing Loss from Theft Group

With roughly one fifth of all preventable losses attributed to theft/pilferage/non-delivery, the following fundamental precautions seem in order:

- Use only new, well constructed packing. Deterioration or collapse of flimsy or previously used fiberboard boxes, wood crates or bags during handling or transit invites pilferage through exposure of the contents.
- Use specifically patterned gummed sealing tapes which enable quick detection of tampering.
- Use shrink wrapping, strapping and banding.
- Use coded markings. Descriptive labeling, illustrations or prominent display of trademarks, logos, and corporate names simplify the pilferer's task. Enroute advertising provides little if any benefits.

NOTE: Codes should be changed frequently to avoid cargo handler's familiarity with them.

- Use bright color coding on sides and corners of items in the same shipment to facilitate identification thus minimizing the likelihood and extent of stray pieces.
- Utilizing of multiple or non-uniform parcels will keep your shipment together and discourage pilferage. This consolidation may include shrink wrap containerization, palletizing and/or banding.
- Losses should be reported immediately to your insurer, carrier(s), law enforcement agencies and other appropriate parties. Quick action can result in recovery.
- In addition to the foregoing physical security guidelines, the shipper should insist on prompt pick-up and delivery of cargo. The longer a shipment stays in a pier shed or staging marshalling yard, the more it is exposed to loss.
- Containerized shipments should have the container sealed after loading and any subsequent openings during transit.

Minimizing Handling and Stowage Damage

Cargo handling equipment and techniques in the various air and seaports of the world range from highly professional to unskilled. The transit environment is rough seas, turbulent air, sub standard roads and uneven track sections, subject your cargo to every imaginable motion and impact. These conditions, considered alone or in conjunction, demand packing for the toughest leg of the journey.

Proper selection of packing methods and material is primarily dependent on the nature of the cargo. Items that provide complete and uniform support to all faces of the package are the easiest and most economical to prepare for shipping. Articles that do not completely fill the selected package must be cushioned and/or blocked, braced, anchored or otherwise immobilized to prevent damage to the cargo.

Some Keys

- Do not exceed the rated weight and volume capacity of the package and/or intermodal container.
- Internal blocking and bracing should distribute the contents weight over entire surfaces rather than concentrate on one or two critical points. The design and application of the materials should be compatible with the load to be supported and the size, shape and strength of the bearing areas.
- Cushioning designed to absorb the energy of shocks and vibrations caused by external forces should be selected on the basis of various factors such as shock resistance, fragility, size, weight, shape and surface finish of the cargo.
- Utilize, palletize or assemble cargo into the largest practical unit consistent with handling, weight and dimension limitations at transshipment point and destination. A unitized load of fiberboard boxes adequately wrapped, strapped and provided with a pallet or skid base will have a much greater survival rate than fiberboard boxes that must be handled individually. Unitized cargo requires use of mechanical handling equipment, substantially reducing exposure to the inherently rougher manual techniques.

NOTE: The required equipment must be available at ports of call.

- Use cautionary markings and handling instructions in English and in the language of the country of destination. International pictorial symbols should also be used to provide universal handling information.
- Clear and complete shipping marks and instructions should appear on at least three (3) surfaces of the exterior package to avoid the rolling, tumbling and flipping of packages in the search for marks and delivery information.

Minimizing Water Damage

Rain, high humidity, condensation and water, separately or in combination, can reduce otherwise stable cargo into a ruin of soggy, stained, mildewed, rusted or labeled merchandise. Salt spray driving across the vessel deck, a rain-swept storage yard, an open truck, the insidious dripping of condensation from the interior of a ship's hold or container or swarming on the cargo itself are all common hazards.

Adequate preparation and packing can protect cargo from these hazards.

- Apply preservatives, corrosion inhibitors or waterproof wrapping directly to the item.
- Provide waterproof linings on the interior of outer packages. Use of desiccants (moisture absorbent materials) in conjunction with vaporproof barrier liners and wraps is particularly effective in protecting moisture sensitive items.
- Shield cargo on top and sides by use of waterproof shrouds. Place cargo on skids, pallets or dunnage thereby elevating the cargo above any poor drainage areas.
- Crates and other large containers should have drain holes in the bottom to preclude collection of water within the packing.
- Containerization does not guarantee protection against water damage. The potential for condensation and hole/leak containers exists.

NOTE: Indelible inks, paint and water repellent labels should be used to eliminate obliteration of marks. Shipping instructions and handling symbols.

HOW TO FILE A CARGO CLAIM

If you are an exporter insuring shipments under a Special Marine, it's most likely that your overseas agent will be the first to become aware of a potential claim. There is a listing on the reverse side of the special marine policy explaining the steps one should take, including the names and addresses of settling agents in major ports of the world. If there are none nearby, the claim is usually directed to contact the nearest correspondent of the Institute of Marine Underwriters or a Lloyd's agent. If you are an importer, there are certain instructions to be given to those in your organization who receive or take delivery of your merchandise. It is most important that all packages be examined and counted upon receiving the shipment. If there are any signs of potential loss or damage, such as breakage or wetting of the ship's package, or the number delivered does not match that shown on the bill of lading, an exception should be taken noting the damage and/or shortage on the delivery document before accepting the merchandise.

If your merchandise is of a fragile or delicate nature subject to breakage, it is important that you unpack and check its condition as soon as possible even if there is no visible damage to the packing. You should have what is known as concealed damage.

Once damage is discovered, there are certain things you must do without delay:

1. Take every effort to reduce the loss and/or prevent further loss as provided for in the Sue and Labor clause of most Ocean Cargo Policies. This could include salvaging, recovering, and/or separating damaged cargo from sound. Reasonable expenses incurred in taking such steps are

of the claim itself. The insured is expected to do exactly what he or she would do if the shipment were uninsured.

2. It is incumbent upon the insured to act as a prudent party in minimizing all damages.

2. Notify your agent or broker so that a survey of the damage can be arranged promptly. The carrier or the carrier's agent should be notified of the time and place of the survey so that they can be represented. If practical, the damaged cargo and the container(s) in which it was delivered should be retained in the condition received until after the survey unless further damage will result by so doing.

3. It is essential that a claim be made in writing against the carrier (air, inland or ocean) as soon as the loss is known (see sample letter). This can be in any form, but must include the bill of lading number, the name of the carrying vessel, a description of the loss or damage and a document stating that the carrier will be held responsible for the loss or damage.

The rates you are charged for cargo insurance are influenced in the ultimate by your experience (premiums versus losses). It is in your best interest to see that losses are reduced by putting the insurance company in a good position to take action against the carrier to recover all or at least a portion of the claims the company pays you. This is called subrogation and amounts recovered are credited to your account.

Once the survey has confirmed that loss or damage has occurred, and was caused by one of the insured perils, the following documents will be needed to substantiate your claim:

1. Whatever document was issued to substantiate the amount of insurance placed and the coverage provided. On an export shipment this would be the original and duplicate of the Special Marine Policy. For imports, it would probably be a copy of the declaration or bordereau.

2. Ocean (or Air) bill of lading—also transshipment bill of lading and railway freight note when applicable.

3. Original shipper's invoice.

4. Packing list, weight certificates or other evidence of the nature and condition of the goods at the time of shipment.

5. The survey report if an independent surveyor was called in to represent your interest. Also, include the annotated delivery document.

6. Copy of claim notice to the carrier and the carrier's reply when it is available.

In special cases, other documents may be requested. A typical notice of a cargo claim could read as follows:

VIZ
EXPORTS

South Eastern Airlines
235 Central Avenue
Graham, PA 19692

6/30/92
Bill of Lading # : 004-86479002
Flight # : South Eastern Airlines 8924
Shipment # : Blender Components
Date Delivered : 6/30/92
Our Reference # : 16988

Gentlemen:

This is to advise you of loss and/or damage to the above referenced shipment.

Consider this our claim in the amount of \$2,556.64.

Complete documentation to follow.

Sincerely,

J. Winters
John Winters
President

cc: Insurer (Policy # P 102496)

An ocean cargo notice would have a heading reflecting the coverage information and bill of lading number.

BEST AVAILABLE DOCUMENT

Time Limitations

	Via			
	<i>Air Freight (Domestic)</i>	<i>Air Freight (International)</i>	<i>Domestic Regulated Land Carriers. Rail, Truck and Freight Forwarders</i>	<i>Ocean</i>
Loss, Damage or Delay	CHECK INDIVIDUAL CARRIERS' AIR WAYBILLS FOR DIFFERENT RULES—PARTICULARLY EXPRESS SERVICES	7 days from delivery if damaged 14 days if delayed	9 months from delivery	1 year from delivery (check Bill of Lading for shorter time limits)
Concealed Damage	CHECK INDIVIDUAL CARRIERS' AIR WAYBILLS FOR DIFFERENT RULES—PARTICULARLY EXPRESS SERVICES	7 days from delivery	If written notice is not given within 15 days of delivery, claimant has burden of proving they did not cause the damage.	Report in writing within 3 days of delivery
Non-Delivery	CHECK INDIVIDUAL CARRIERS' AIR WAYBILLS FOR DIFFERENT RULES—PARTICULARLY EXPRESS SERVICES	120 days from date of issue of air waybill	9 months after a "reasonable time" for delivery	1 year from scheduled delivery

Individual carriers may have specific requirements regarding claim notification and carrier's rules should be consulted. Also, all domestic (U.S.) deregulated land and air movements may be subject to individual contracts that can shorten the time limitations for notification of claim.

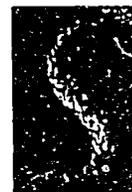
MARINE SERVICE

Through their diversified subsidiaries, CIGNA Companies offer worldwide claims settling facilities, Risk Management consulting services and recovery capabilities. Specific and descriptive information concerning marine insurance and related services can be obtained by writing:

CIGNA
Super Service TLP35
P.O. Box 7716
Philadelphia, PA 19192-2096

In addition, we maintain a staff of marine technical specialists strategically located in the major ports of the world. Experienced in packing, cargo handling and all modes of transport, they are dedicated to the prevention of losses.

BEST AVAILABLE DOCUMENT



TRANSPORTATION

Several modes/methods of transportation or refinements of previous ones need to be discussed. The following terms with definitions/explanations are designed to assist the shipper in understanding the current state-of-the-art, its evolution and perhaps future developments.

General Cargo Vessels

These vessels have cargo holds, tween decks and conventional weather deck hatch covers. They are designed to handle a multitude of break-bulk cargo e.g., pallet loads, bags, drums, cartons, cases and crates. Additionally, containers can be accommodated on deck and sometimes underdeck. In some instances, deep tanks for cargo oils may be fitted in holds. These carriers have their own cargo cranes; therefore, cargo is generally loaded aboard using vessel's gear and forklift machines. Although this is the traditional method of ocean cargo carriage there is a growing trend toward container or Ro-Ro type vessels due to the labor intensity of general cargo handling.

Container Vessels

This vessel category carries all of its cargo in unitized containers both on and under deck. The latter are stowed in vertical cells formed by angle corner guides. The deck-stowed containers are stacked sometimes five or six high and twelve across, interlocked with fittings and secured by special lashings. Most of the container vessels are not equipped with cargo handling gear, relying instead on shore cranes. Nonetheless, containers do enjoy rapid loading and discharge. Some vessels are equipped with a plug-in system for refrigerated containers or have entire holds/cells under refrigeration.

Roll-On/Roll-Off (Ro-Ro)

This shipping system involves the direct driving-on and driving-off of cargo. The Ro-Ro method enables shippers to load cargo on the chassis, trailer and "low-boy" at the plant or warehouse site, transport the vehicles to embarkation points and have them loaded directly onto the vessel.

By rolling cargo on board these vessels and rolling it off at its destination, shippers can reduce the number of times their cargo is handled.

The inherent disadvantage of Ro-Ro is the waste of cargo carrying capacity due to undercarriage and all-around clearance requirements.

Although the degree of packing may be reduced for Ro-Ro shipments, keep in mind that the cargo will travel aboard an oceangoing vessel and will be subjected to all the hazards of an ocean voyage.

Variations on the Ro-Ro Theme:

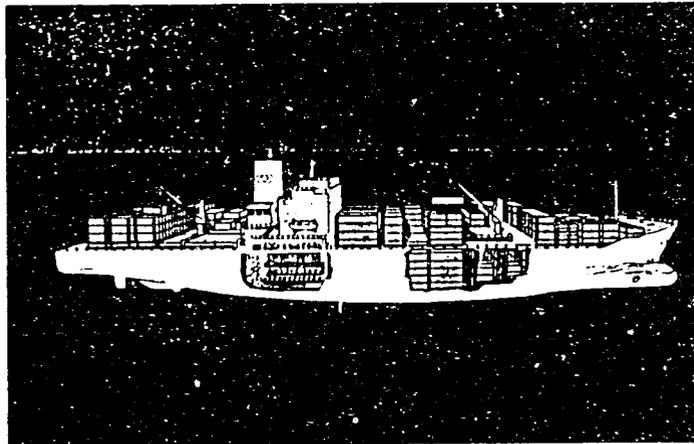
Sto-Ro (Stowable Ro-Ro)—Contrary to the Ro-Ro, no cargo remains on wheels but is directly loaded onto vessel decks. The stowage is similar to an open load-on/load-off (Lo-Lo) vessel; however, the cargo is brought on board either over a stern/bow quarter ramp or through a side port door. Vessel operations can turn to this concept of cargo handling as a means of combining the undoubted handling advantages of the Ro-Ro (improved turnaround times) with the efficiency of a Lo-Lo (increased utilization of a ship's cubic capacity).

Float-On/Float-Off—A heavy deck semi-submersible vessel designed to permit oversized indivisible cargo being floated into position for deck stowage. The reverse procedure is used at the destination port where the load is floated from the submerged deck that is ballasted down for the outturn. The vessel travels with its deck and load above the water.

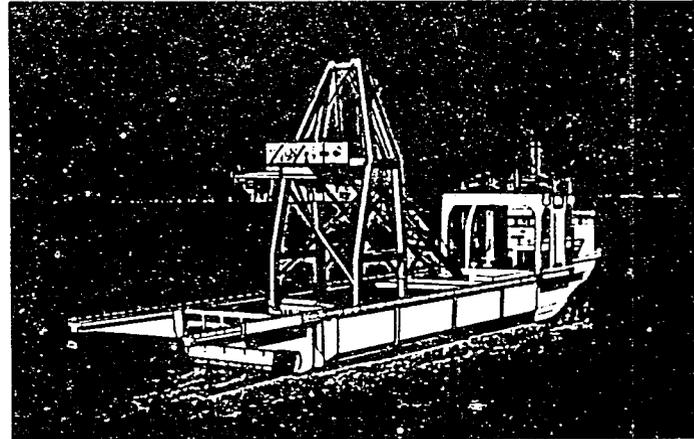
Float-On/Float-Off—Ro-Ro conversion or conversion in which vessel trailer decks are converted into modern cattle pens capable of accommodating in excess of 2,000 animals. New installations include provision of fresh water through evaporation, increased tankage "barns" for 1,600 cubic meters of hay or straw and an air filtration plant.

Combination Container and Ro-Ro Vessels—This design allows for flexibility of operation by incorporating container stowage and other wheeled cargo handling capacity. These vessels carry containers on the under deck forward and have a stern ramp with tween decks for the carriage of on/Roll-off cargo in the aft underdeck. The Ro-Ro cargo may consist of oversized pieces such as construction equipment, i.e., bulldozers and excavators, which are driven onto the vessel via the stern ramp. Containers can also be stowed on the Ro-Ro decks but are brought aboard the vessel on chassis and removed with forklift machines. If space and equipment is available, container transport can be left on its chassis during transport.

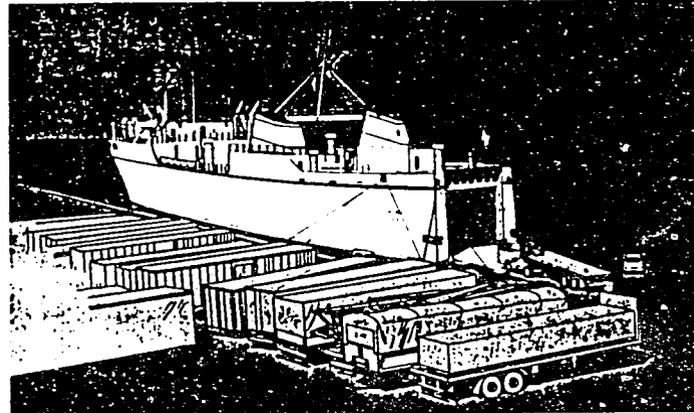
Heavy Lift Vessels—Specifically designed to carry heavy or oversized cargo, these vessels meet the rising demand for modular transportation for fully equipped plants and/or equipment. Most heavy lift ships are self-sustaining vessels equipped with gantry or telescopic auxiliary cranes for the conventional load-on/load-off ramps for Ro-Ro movements, and also possess submersible capabilities to accommodate float-on/float-off operations. In some instances operators extend their capabilities to cover inland transit with multi-axle self-propelling transporters enabling carriage of cargo from the point of manufacture to final destination.



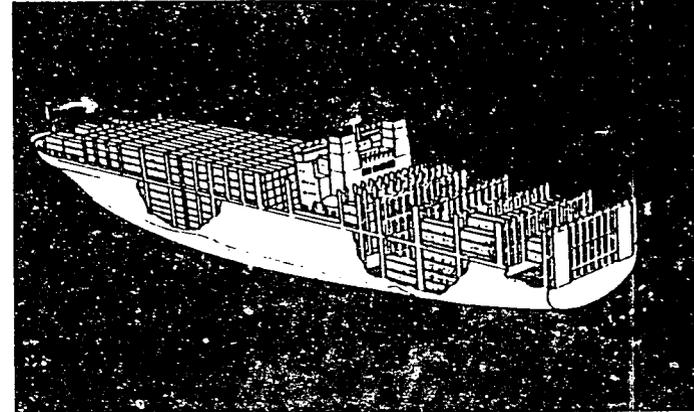
Container Vessel



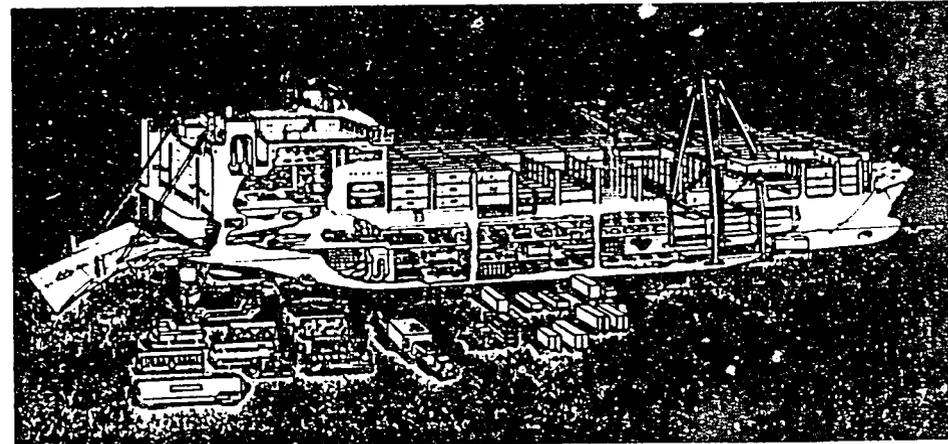
Heavy Lift Vessel



Ro-Ro Vessel



Hatchless Container Vessel



Combination Container/Ro-Ro Vessel

These ships are of a revolutionary design, answering the question "who needs hatchcovers?" In all but the two forward cargo holds, reserved for special and non-containerized cargo, traditional hatchcovers are missing. Instead, permanent cell guides run from the tank top to several levels above deck. As a result of the continuous cells, container twistlocks and lashings are not used. Speed of load/discharge is improved and container shifting is reduced. Taking into consideration that five cargo holds are exposed to rain and sea water, emphasis has been put on the development of the most efficient bilge system.

BEST AVAILABLE DOCUMENT

CONTAINERIZED CARGO

LOSS CONTROL— CONTAINERIZED CARGO

The use of intermodal containers for the transport of a great variety of cargo has become increasingly popular in recent years. Intermodalism—a concept that embraces the movement and transfer of standardized cargo containers by sea, air, and surface—has greatly reduced cargo handling, particularly in Door-to-Door shipments. Development of specialized containers with a wide range of types, sizes and configurations permits containerization of most cargo.

Prompt, undamaged arrival of the complete shipment at destination is the primary objective of the shipper. In committing goods to containerized transport, the shipper can reduce losses by

- Selecting the right type of container for the goods in question
- Inspecting the container to ensure proper accommodation and protection of goods
- Packaging goods to withstand the hazards of the “toughest leg of the journey”
- Stowing and securing goods in the container to prevent damage to the goods, container and transport vehicle
- Properly describing and documenting the container contents, locking and sealing the container and recording container and seal numbers on all shipping documents
- Timely unloading at destination

INTERMODAL VARIATIONS

The popular intermodal container, adaptable to carriage by truck chassis, railcar, barge and oceangoing vessel, is the most common form of containerization. The considerations governing preparation and stowage of the cargo in these containers are no less applicable to other methods of cargo transport.

Trailer-on-Flatcar (TOFC)—“Piggy-backing” highway trailers on container chassis that can be carried on specially equipped rail flatcars.

Container-on-a-Flatcar (COFC)—A carriage of intermodal containers detached from their highway chassis and “boggie” on rail flatcars.

Two recent developments in the rail movement of containers/trailers on flat cars have been introduced into the domestic (U.S.) market.

Double Stack Train—This service involves a series of containers/trailers, stacked 2 high on specially designed rail cars. Linking the major trading corridors, this system is designed to provide smoother rides than their surface competition, either truck, conventional flatcar or alternative rail equipment. In addition, a number of technical features enable high-speed transit with a minimum of shock and vibration to cargo through the dampening of slack, sway and vertical acceleration forces. To date, this method of transportation has demonstrated substantial reduction of damage and increased efficiency.

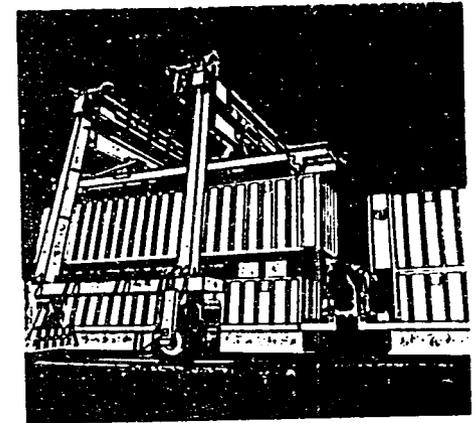
Trailer-Rail—This new piggyback system will allow railroads to handle the full range of increasing diversity of trailer lengths over shorter hauls. The full system is composed of the following 3 components.

- The Trailer-Rail terminal, a bare-bones rail yard consisting of a track, parking area, driveway and ramp for handling the trailer on and off the railcars
- The tractor-Railer, a lightweight highway tractor, equipped with retractable steel railroad wheels that can both load and unload trailers in the rail yard and pull a Trailer-Railer and train on the rails

- The Trailer-Railer, the central part of the system, a short, four-wheeled car of skeletal design, with a drop deck platform that connects the front end of one trailer and the rear of another

The entire loading cycle involves a tractor trailer driver backing a trailer into the drop deck of the railcar, “jackknifing” the trailer parallel with the track and positioning the trailer landing gear adjacent to a loading stanchion located at the side of the track. This stanchion is manually rotated across the track beneath the trailer landing pads. The driver then activates the hydraulic lift wheel of the tractor to lower the trailer until the landing gear rests on the stanchion. The next rail car is now able to be rolled into place.

Containerization and double stacking have led to increased use of land-bridging, i.e., ocean shipments from the Far East to West Coast ports and then transporting the cargo to inland markets via rail or truck. In Europe this concept is termed Microbridge or IPI (Interior Point Intermodal).



Double Stack Trains

This view shows the kinds of activity that took place in major harbors in 1800. In 1790 John Fitch launched America's first passenger steamboat service from this location.

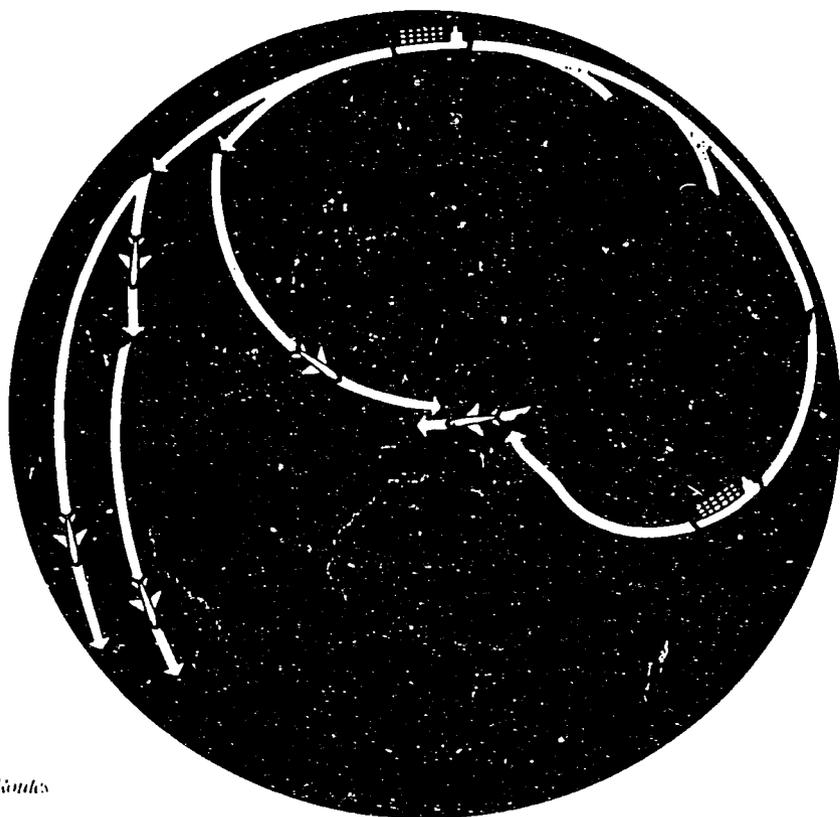
BEST AVAILABLE DOCUMENT

SEA-AIR

The growing practice of routing cargo by both sea and air within a single journey has been somewhat obscured by the Double-Stack and other land-bridge developments. No longer stymied by incompatible equipment and scheduling, the ocean to air transshipment is now able to marry the low cost of ocean shipping with the timely convenience of air freight. Examples of this trade pattern include a sea-air leg originating in Japan and moving to North America's West Coast via ship. From there cargo is transferred to air freighter or combination passenger-cargo plane for the flight to Europe.

Other routes involving traffic to/through South America and the Middle East have also been active. One of the problems inherent in this transportation hybrid is the increased exposure to loss and damage during cargo transfer between the two modes. Some shippers have resorted to shipping loaded air cargo containers inside 20- and 40-foot long intermodal units for the sea transit.

Air Cargo Containerization – The unique aspects of cargo carriage via air and the application of containerization to this transport mode are treated separately in this booklet. (See Air Cargo discussion.)



Sea Air Routes

CONTAINER SERVICES

Door-to-Door (House-to-House)— The greatest benefits of containerization are realized when the shipper uses the container to carry goods directly from his or her premises to his or her customer's location. Perhaps the only time the container will be opened while enroute is for Customers inspection. Reduced susceptibility to pilferage and theft, elimination of multiple handling of individual items of cargo and the least possible exposure to the elements are all attractive features of Door-to-Door service. In utilizing this type of service, the shipper accepts the additional responsibility of ensuring that cargo is properly stowed and secured in the container, precluding damage to the cargo, container or transport vehicle.

The tendency to reduce packing protection of cargo destined for Door-to-Door container shipment must be resisted. The ocean leg of the voyage will still subject the cargo to severe motion stresses, considerably greater in force than during highway or rail movement. Reduction of packing protection must be carefully evaluated and implemented only after due consideration of the hazards of ocean transport, including the lifting force at transshipment points.

Port-to-Port (Pier-to-Pier) – When cargo volume does not provide for a full container load (less than container load or LCL) or when the shipper or consignee does not have the facilities to load or unload the containerized cargo at his premises, he or she can utilize the services of forwarders, consolidators or the carrier to stow the goods in containers at the port of departure. This service is less attractive than Door-to-Door service. Since the cargo is not in a container for the entire journey, it is subject to the same degree of exposure to weather, handling and stowage damage and theft/pilferage as break-bulk cargo. **MAXIMUM EXPORT PACKING STANDARDS ARE REQUIRED WHEN SHIPPING PORT-TO-PORT.**

Door-to-Port – Combinations of Door-to-Door and Port-to-Port service are possible, depending on the desires of the shipper and the facilities available. While these combinations are more advantageous than Port-to-Port service, the cargo will still be exposed to the hazards of theft, weather and additional handling during part of the journey.

AS IN PORT-TO-PORT SERVICE, THE CARGO MUST BE PACKED TO THE HIGHEST EXPORT STANDARDS.

LCL (Less Than Container Load) – On LCL shipments, the shipper can still load goods into a container, but the container will be delivered to a consolidation point at the pier where other shippers' goods will also be stowed in the container. What this means is that the smaller, low-volume exporter can still have cargo containerized, although this is not as desirable as a sealed House-to-House container.

BEST AVAILABLE DOCUMENT

SELECTING THE RIGHT CONTAINER

Consultation with the carrier will permit selection of the type and size container most suitable for the cargo.

Many types and sizes are available to the shipper. The most common is the dry cargo container that may be used for a great variety of general cargo. Specialized containers should be used for goods or commodities requiring special environments.

Particular attention must be given to the container weight limitations so as not to overload.

Cargo Containers

1. End Loading, Fully Enclosed

The basic intermodal container with end doors, suitable for general cargo not requiring environmental control while enroute.

2. Side Loading, Fully Enclosed

Equipped with side doors for use in stowing and discharge of cargo where it is not practical to use end doors, as when the container must remain on a railcar while cargo is placed in or removed from the container.

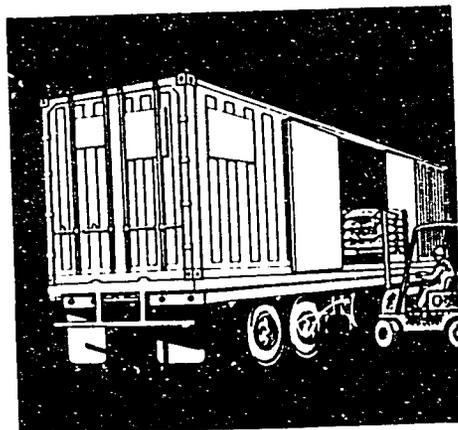
3. Open Top Used for carriage of heavy, bulky or awkward items where loading or discharge of the cargo through end or side doors is not practical. Most open top containers are equipped with fabric covers and are often termed "soft" or "rag" top containers. Some open top versions are fitted with removable hatch type panel covers or detachable full metal roof.

4. Ventilated Equipped with ventilating ports on ends or sides, and used for heat generating cargo or cargo requiring protection from condensation (sweat) damage. Versions with powered air circulating fans are available. Vents are normally fitted with baffles to prevent entry of sea or rain water.

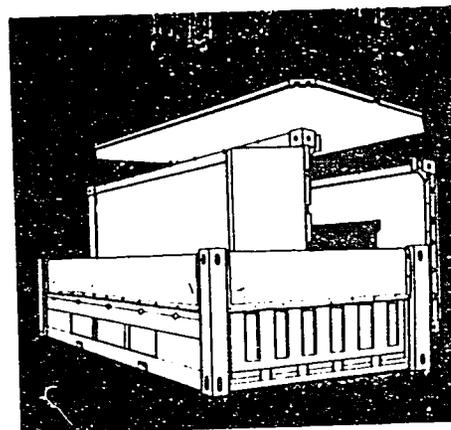
5. Insulated For cargo that should not be exposed to rapid or sudden temperature changes. Available in ventilated or non ventilated versions. Some carriers provide containers with heating systems for special applications.



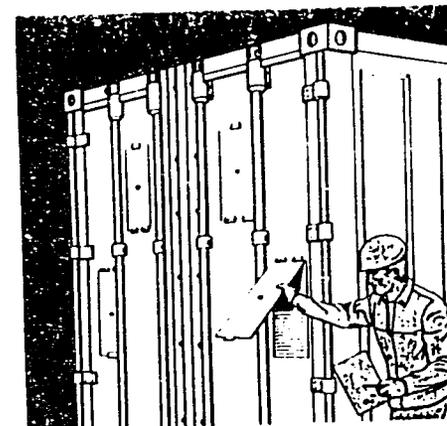
End Loading, Fully Enclosed



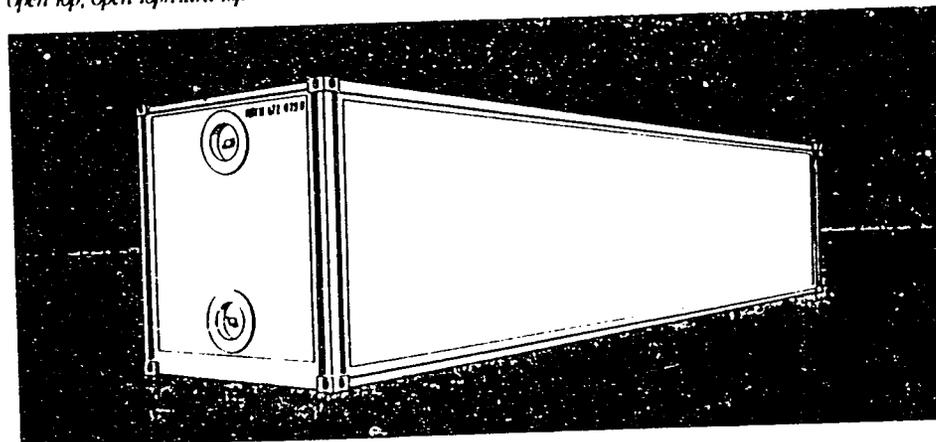
Side Loading, Fully Enclosed



Open Top, Open Top/Hard Top



Ventilated



Insulated

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6. Refrigerated—Insulated and equipped with a built-in refrigeration system, powered by direct electrical connection or by diesel or gasoline generator. It is used primarily for foods or other commodities requiring a temperature-controlled environment.

7. Liquid Bulk—Tank-type containers for carriage of liquids. Some have been designed to high level specifications for carriage of certain hazardous materials.

8. Dry Bulk—Designed for carriage of bulk cargo such as dry chemicals and grains.

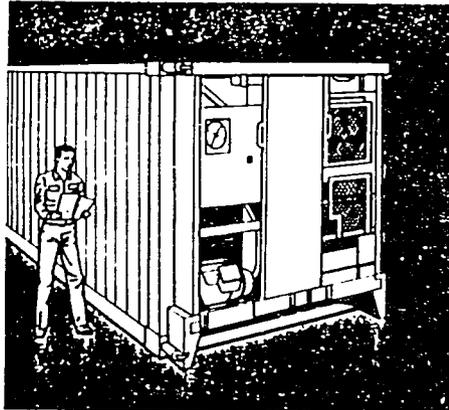
9. Flat Rack—Available in a variety of sizes and models, the flat racks are used for lumber, mill products, large, heavy, bulky items, machinery and vehicles. Some are equipped with removable sides.

10. Auto—Used for carriage of vehicles and available in enclosed or open versions.

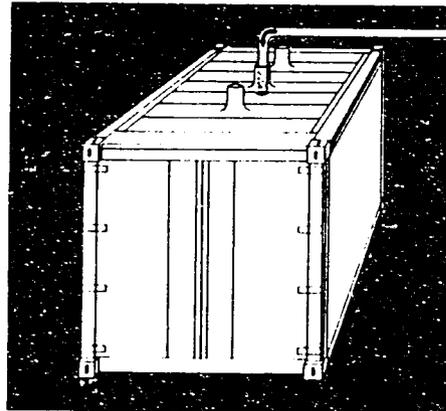
11. Livestock—Configured for the nature of livestock carried, containers are available for transporting poultry, cattle and other livestock. Also, transport boxes can be loaded onto flats.

12. Controlled Atmosphere—These systems carry a cylinder of liquid nitrogen and carbon dioxide. Through computer-based controls, the atmosphere within the container can be maintained at preset levels to meet requirements of commodity carried. Used mainly in the transport of produce to extend the post-harvest and storage life.

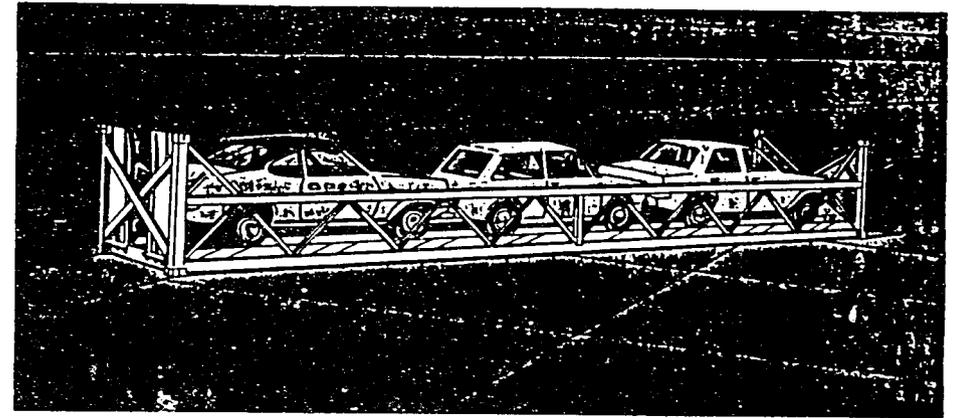
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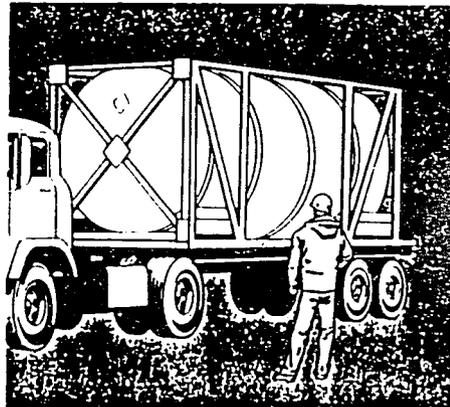
Refrigerated



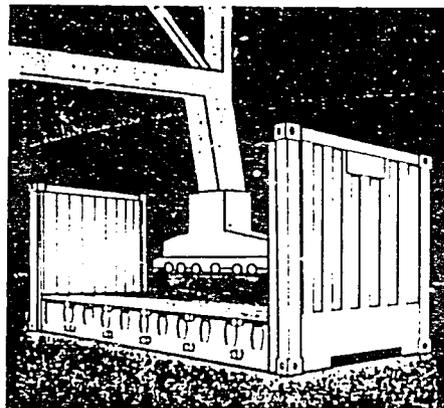
Dry Bulk



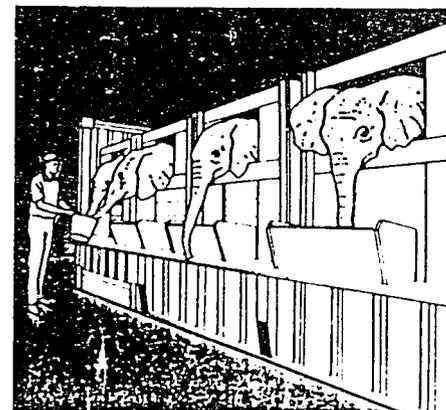
Auto



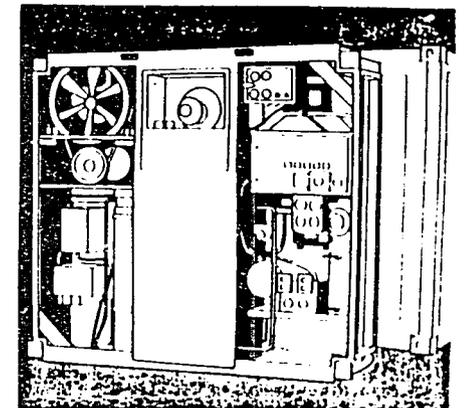
Liquid Bulk



Flat Rack



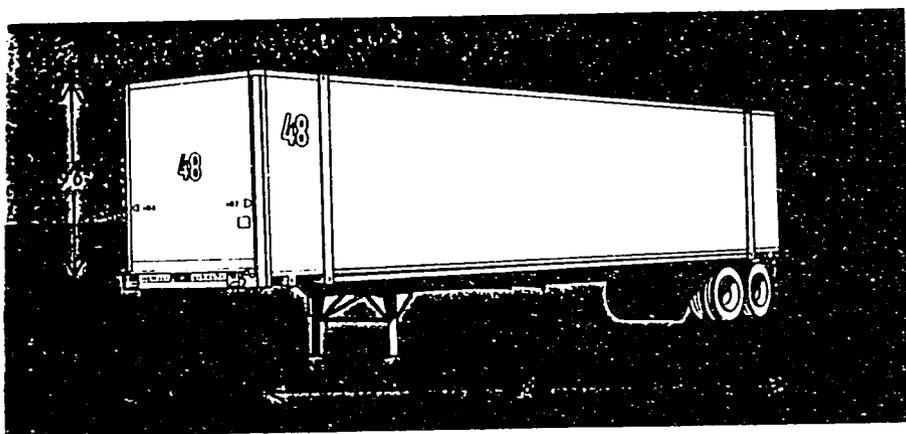
Livestock



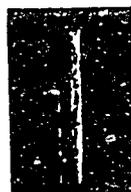
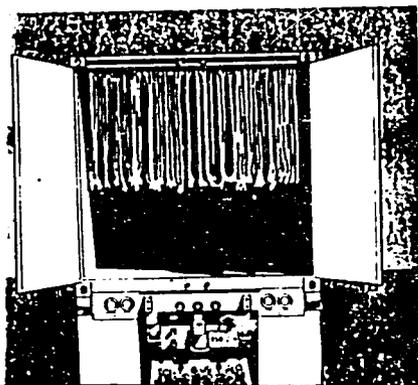
Controlled Atmosphere

High Cube—These containers are for high volume/low weight cargo and greatly increase the cubic area available for cargo stowage. High cube containers are in heights to 9.5 feet and to lengths of a maximum of 48 feet.

Garment—With special tie downs, internal ceiling fittings, this container handles hanging garments.



High Cube



CERTIFICATION OF INTERMODAL CONTAINERS

The International Convention for Safe Containers (ICSC), effective September 6, 1977, made certain structural requirements mandatory for containers moving in international trade. Under the Convention, approved units are issued safety plates that are affixed to the container at the time of manufacture. In addition, ACEP (Approved Continuous Examination Programs) or periodic examinations of containers in accordance with procedures prescribed or approved by signatory governments are required.

The owner or operator must maintain the container in safe condition.

A number of independent firms provide testing and inspection services for intermodal container operators. Certification of adequacy of construction occurs prior to delivery of the new container to the carrier and periodic inspections must be performed beginning five (5) years after manufacture. Maximum periodic examination interval is 30 months.

The shipper should look for the safety plate and ACEP or examination decal to determine that the container(s) supplied for his use have met adequate construction and maintenance standards.

Presence of the safety plate and examination decal is not, however, a guarantee that the container is presently free from defects, as damage may have occurred since the last certification inspection.

The shipper must take a personal inspection of the container before use to be absolutely certain that it is in condition to adequately protect his goods.

An understanding of the hazards to which a container may be exposed (as depicted in the two illustrations on pg 69) is essential. This knowledge will permit intelligent inspection of the container and also provide the background necessary

INSPECTING THE INTERMODAL CONTAINER

With the advent of containerization, it was anticipated that cargo damages would be greatly reduced. This has been realized; however, it is largely dependent upon the structural integrity of the container.

The following checklist will assist you in inspecting the container to be sure it will properly protect your cargo. Containers that leak or have inherent defects that endanger the cargo or pose a safety hazard to personnel must be rejected.

The interior must be free from splinters, snags, dents or bulges. These may interfere with loading. Serious defects indicate the container is structurally unsound.

- **Watertight Integrity**—“Light” tests whereby you enter the container, have the doors closed and look for light entry via the roof, side and door panels and deck are a must. Also, previous patches and repairs must be checked to ensure they are watertight. Hose (water) or smoke tests are alternative methods of discovery.

- **Fittings**—Cargo tie-down cleats or rings should be in good condition and well anchored. If ventilation openings are present, be sure that they have not been blocked off, and that they are equipped with baffles to prevent rain or sea water entry.

- **Cleanliness**—Free of residue from previous cargo particularly odors that may taint your goods. Also, check the container for nails or protruding fastenings that might puncture cargo package or inflatable dunnage.

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The exterior must be free from dents, bulges or other damages; all may interfere with handling

- **Doors**—Be sure doors can be securely locked and sealed. Check that door gaskets are in good condition and watertight when closed. Inspect door hardware closely. If bolts or nuts can be easily removed from the outside with simple tools, it means that the container can be opened without breaking the seal or lock—an attractive invitation to the pilferer

- **Fittings**—A quick look at the liting fittings at each corner of the container will reveal those that are obviously damaged or unsafe. Check the fittings that secure the container to the trailer chassis, they should all be in working order and in use.

- **Covers/Hatch Panels**—If an open-top container, be sure that the fabric cover supplied with the container is in good condition and can be properly secured. Check hatch panels for close watertight fit.

The following is a partial checklist of typical types of damage

Front

Front Panel—Dented, torn, holed or punctured.

Patches—Loose, not of same material as panel, not sealed or riveted with waterproof Customs-approved rivets, poor welds, not primed or painted.

Top Rail—Bent, cut, crushed or fractured

Corner Posts—Bent, broken, cut, gashed or distorted.

Upper and Lower Corner Fittings and Attachments—Fractured or distorted fitting, cracked attachment welds

Rivets—Loose or missing.

Welds—Improperly made, not primed or painted

Sides

Panels—Dented, torn, holed or punctured.

Corner Posts—Bent, broken, cut, gashed or distorted.

Upper and Lower Corner Fittings and Attachments—Fractured or distorted fittings, cracked attachment welds.

Door Holdbacks—Damaged or missing

Rear

Doors—Difficulty in opening and/or closing.

Door Panels (Metal or other)—

Torn, cut, holed or punctured

Door Locking Bars (Rods)—

Seized, bent, broken or twisted

Door Locking Bar Cams—Bent or broken

Door Handle and Retainers—

Broken, bent or missing

Door Cam Lock Retainers (Keepers)—

Bent or broken.

Door Hinges—Broken, torn, twisted,

binding or seized

Door Seals (Gasket and attachments)—

Cut, torn or loose

Door Header—Cut, broken, distorted or dented

Door Sill—Cut, fractured or distorted

Anti-Rack Device (if any)—Bent, cut,

damaged or broken

Rain Gutter—Bent, broken or crushed

Roof

Panel—Punctured, dented or distorted

Upper Corner Fittings and Attachments—Fractured or distorted fittings, cracked attachment welds.

Corner Protection Plate (where provided)—Punctured, dented or distorted.

Under Structure

Cross Members and Attachments—Crushed, cut, bent, distorted or broken loose from bottom side rails or floor.

Tunnel Recess (if any)—Cut, dented,

distorted or cracked weld attachments

Forklift Pockets (if any)—Cut, dented,

distorted, bottom straps broken or bent

Interior

Roof Sheet—Punctured, dented or distorted.

Roof Bows (if any)—Bent, cut or broken loose from roof.

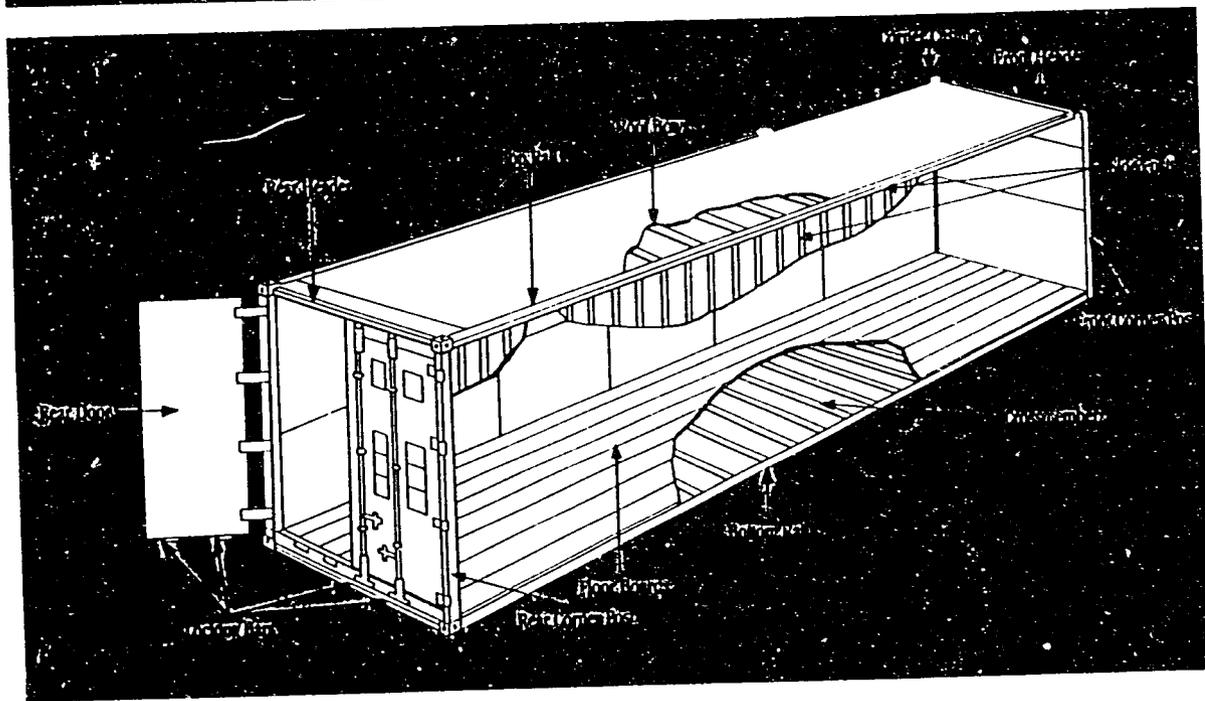
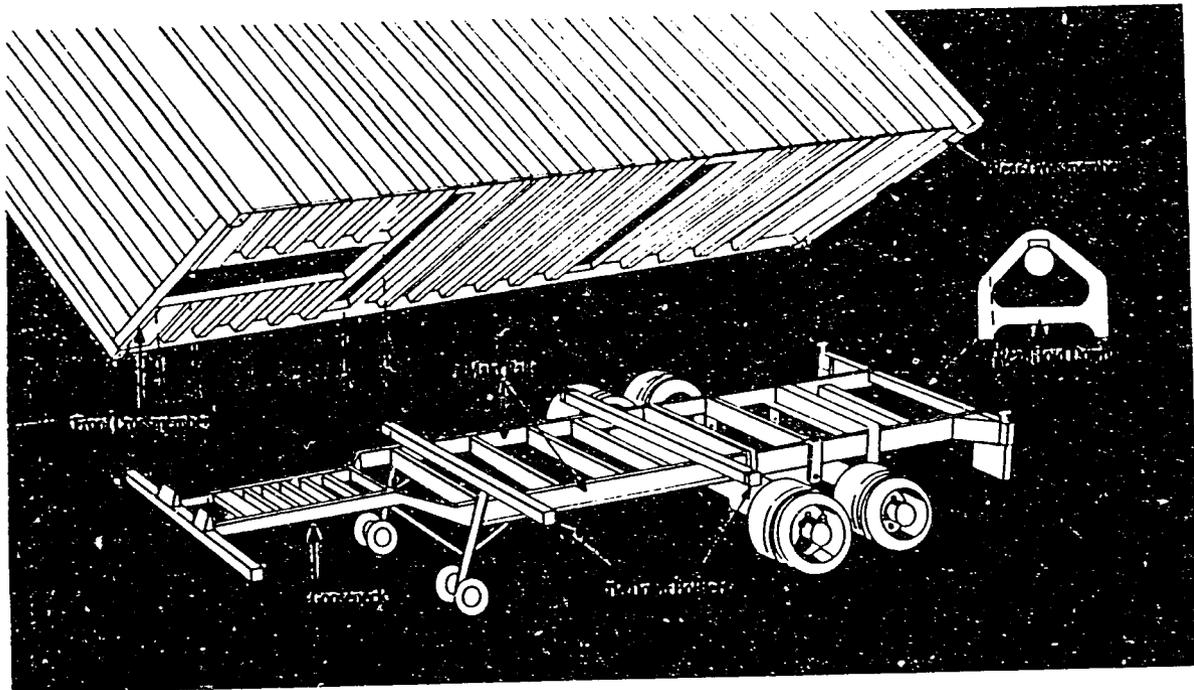
Floor—Torn, gouged, broken, shrunken, warped, stained excessively

Sides—Dented, torn, holed or punctured.

Logistic Track (side walls or floor)—Torn, loose, bent, missing or cracked welds.

Liners (where provided)—Torn, punctured, gouged, pulled loose, stained excessively

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CONT.

In addition to the previous container inspection steps, if you are utilizing a refrigerated, tank or other special purpose container, check the following:

Motors/Compressors — Check to see that they are in good operating condition and perform as required. Be sure that adequate fuel has been supplied.

Fittings, Valves/Piping — They must be free of leaks with tight fittings. Valves should operate smoothly and seal tightly.

Electrical — Wiring and connections should be secure, watertight and free of corrosion. Switches should operate properly. Be alert for potential shock hazards.

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STOWING CARGO

PREPARING THE CARGO

An intermodal container is essentially a ship's hold on a reduced scale. When the containers are placed aboard ship for an ocean voyage, the cargo stowed in them is subject to the same forces and damage hazards while at sea that affect cargo shipped in break-bulk fashion.

The same principles and techniques that govern export packing and cargo stowage of break-bulk shipments are equally valid when preparing cargo for intermodal shipment.

Pack For The Toughest Leg Of The Journey!

Refer to the Basic Packing Guide section of this booklet for guidance in selection of packaging.

Be certain that goods cannot move within the fiberboard box, wood crate or other shipping package. Immobilize the contents by blocking or bracing and/or providing adequate cushioning.

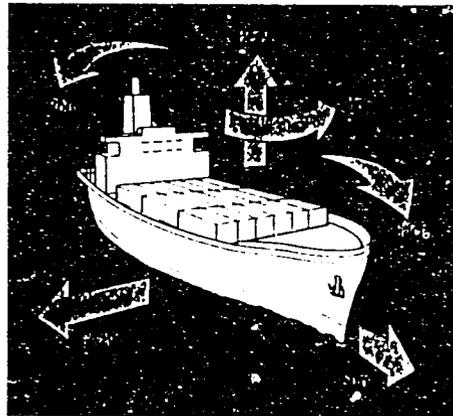
Fiberboard boxes or wood crates must be able to withstand the weight of cargo stacked up to an 8-foot height. They must be able to survive lateral pressures exerted by adjacent cargo—up to 70 percent of the vertical stacking weight pressure. This will help to prevent crushing as the container leans (up to 45°) during handling or at sea.

Heavy items, machinery and cargo not uniform in shape or dimension should be crated, boxed and/or provided with skids to permit ease of handling and compact stowage.

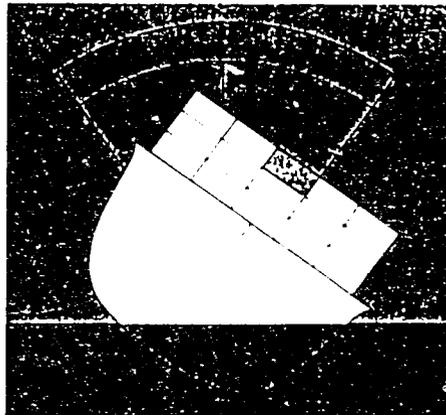
Where possible, cargo should be unitized or palletized. Cargo handlers are then required to use mechanical handling equipment to move cargo.

The "Pennsylvania" one of the first iron steamships built in America expressly for ocean-going commerce.

Provide adequate water damage protection. Use of desiccants (moisture-absorbing materials), moisture or vapor barrier paper, plastic wraps, sheets or shrouds will protect cargo from water contact or condensate damage. Corrosion susceptible machine parts should be coated with a preservative or rust inhibitor.



A ship at sea may move in six different directions.



This container may travel 70 feet with each complete roll, as often as 7 to 10 times per minute.

PLAN THE STOW

Observe Weight Limitations

Do not exceed rated capacity of package or intermodal container. Do not exceed permissible weight concentrations per square foot of floor load. Check highway weight-axle limitations on both sides of the ocean voyage because some containers have total capacities that exceed local limits.

Avoid Mixing Incompatible Cargo

Cargo that emits odor or moisture should not be stowed with cargo susceptible to tainting or water damage. Items with sharp projections or awkward shapes should be segregated from other cargo by boxing, crating, padding or use of partitions. Cargo subject to leakage or spillage should not be stowed on top of other cargo.

Observe Hazardous Material/Dangerous Goods Regulations

Consult with carrier for regulations and restrictions regarding shipment of:

- combustibles
- explosives
- flammable liquids
- flammable solids
- gaseous materials
- radioactive materials
- magnetized materials
- spontaneous combustible materials
- corrosives

- poisons
- oxidizers
- infectious substances
- etiologic agents

After receiving information from carrier, proceed as follows:

Label and mark hazardous material/dangerous goods properly. (See Hazardous Materials section.) Affix warning placards to container exterior. Note that placards vary throughout the world. What is acceptable at origin may not be in compliance with enroute or destination countries' regulations. Check before shipment to avoid embargo or delay.

Record the nature of the cargo on all shipping documents.

Have All Cargo and Materials Ready Before Stowage Begins

Planning ahead facilitates proper placement, stacking and weight distribution. Additionally, it precludes removal of cargo already stowed to accommodate unexpected items, and permits installation of blocking, bracing and filling of voids as stowing operations progress.

Plan for Ease of Unloading

Stow cargo in reverse order of desired cargo discharge.

Be sure that cargo for multiple consignees is physically separated by partitions, dividers or other suitable means.

Make sure that forklift openings in pallets or skids face doors.

Fill any voids, but avoid wedging or jamming cargo in container.

Cosmetic Damage

The exterior packing of your commodity is often the first representative the consignees of your company. A package

BLOCKING, BRACING AND OTHER SECURING MATERIALS

showing exterior damage, although perhaps only cosmetic in nature, can cause loss of market, poor shipper/consignee relationships and more importantly cause the goods to be rejected and/or not be paid for even though the contents may arrive without damage.

Repackaging commodities can be very costly as well as time consuming. Remember, the appearance of your product is in many cases as important as the product itself.

STOWING THE CARGO

Fiberboard Boxes

Fiberboard boxes containing tightly packed, dense items that support sides and ends of the box are stowed using the "bonded block" method. Fiberboard boxes containing lightweight or fragile items that provide little or no support to the box surfaces are stowed by stacking directly one atop the other. This method takes advantage of the vertical rigidity of the side walls and corrugations in each box.

Use plywood or lumber dunnage or fiberboard dividers as auxiliary decking sheets to segregate tiers of different sized fiberboard containers.

Provide plastic or water-repellent shrouds over top and sides of load to protect against damage from water (ship's sweat or leaking containers).

Use dunnage or pallets on the container floor to elevate the cargo and allow drainage should water ingress.

Fill all voids by bracing or using fillers to prevent sliding or shifting of cargo.

Fill end voids to prevent sliding or shifting of cargo.

Use of Retaining Paper

Use rough paper between stowage blocks of fiberboard containers with smooth exteriors to prevent sliding or shifting.

Lumber

Should be clean and dry (not above 19 percent moisture content).

1. Use suitable hardwoods as filler, decking, blocking, bracing and for constructing partitions/dividers.

2. Most common sizes used are nominal 2" x 4" and 4" x 4". Should be free of significant splits or knots.

Plywood

1. Use for partition faces, dividers, auxiliary decking and blocking in limited spaces.

2. Should be clean and dry.

Inflatable

Available in paper, fabric, rubber or plastic, in both reusable and disposable forms. A check for sharp edges and/or protrusions must be made to avoid punctures. Use it for filling voids; light and medium duty bracing.

Patented Systems

Various patented cargo control and dunnage systems are available. Pre-built partitions, shelves, straps, laminated linerboard bulkheads and dunnage bars facilitate stowage and securing of cargo.

Fiberboard

Available in sheets, rolls and in prescored structural shapes. Use sheet for dividers, decks, partition facings and auxiliary decks.

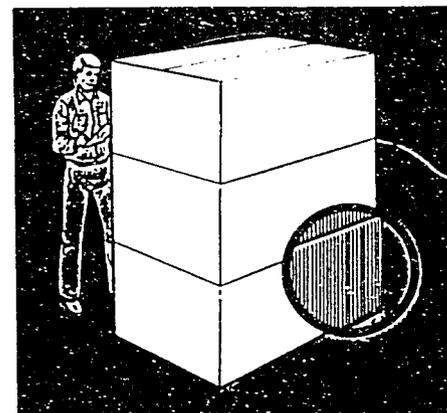
Use rolled fiberboard sheets (solid or corrugated) for linings or facings and for filling voids.

Strapping

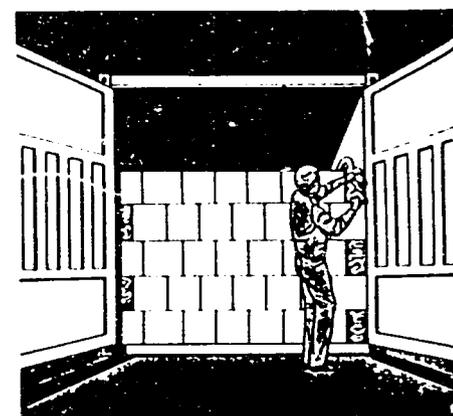
Heavy duty metal strapping is used to separate cargo units and for securing heavy or awkward items.

Nonmetallic strapping is used for lightweight cargo and has only a fraction of the strength of similar steel material. It would not resist shearing on a sharp edge, and will stretch as much as 9 percent.

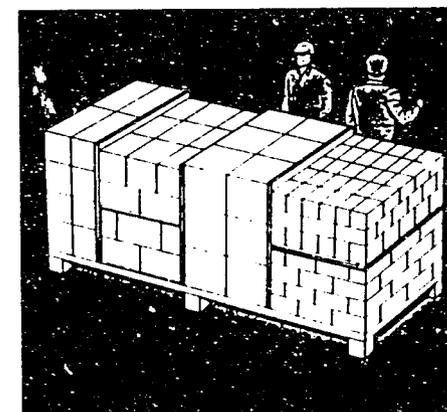
Metal and plastic straps must be firmly anchored and properly tensioned.



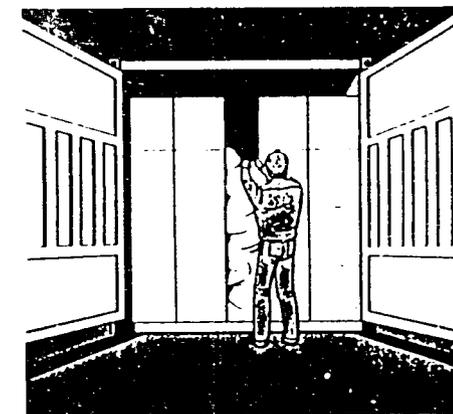
Vertical positioning of corrugated slats provides best support for stacking.



Fill side and end voids to prevent movement of cargo.



Use of dividers and auxiliary decks to segregate cargo by type, size or destination.



When stacking directly on top of lower boxes, keep rolls at the center and immobilize by constructing partitions or inserting inflatable securing materials.

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Wood Boxes and Crates

Crates of uniform size and weight should be stacked directly one atop another.

Separate groups of crates with different weights or dimensions by use of partitions, dividers or auxiliary decking.

Fill voids at top, sides or ends by use of partitions or fillers.

If large voids are present, block, brace and tie down cargo to prevent movement in any direction.

When bracing crates, apply bracing to strength members only, not to panels or sheathing.

Machinery or Heavy Items

Distribute weight by proper placement and use of cradles or skids.

Use deck cleats and bracing to prevent lateral and fore-and-aft movement. Use metal strapping to prevent vertical movement.

Extremely heavy dense items should be properly secured to the container floor. Consult with carrier or container leasing operator for approved method(s).

Top-heavy items should be shored and braced to prevent toppling. Do not brace against the side panels of the container. All bracing must bear on a structural member of the container. Diagonally positioned bracing to the container floor is preferable for cargo that is top heavy.

Provide plastic or water-repellent paper shrouds over the top and sides of the item to prevent water damage.

Bags, Sacks and Bales

Use "crossier" method of stacking bags and sacks. (Refer to illustration.)

Use sufficient dunnage layer on container floor to provide for condensate drainage.

Separate bags, sacks and bales from other cargo by using partitions.

When stowing bales, provide dividers between rows and tiers to prevent chafing and friction between metal bands or strapping.

Liquid Cargo (Drums)

Drums of liquid cargo should be separated from other cargo by use of partitions. Use adequate dunnage between tiers of drums to provide a level flooring surface for stacking.

Drums containing liquids should be floor loaded. The drums should be stowed on end with filler holes up as opposed to on their "rounds." Use dividers to protect drum rims from chafing damage.

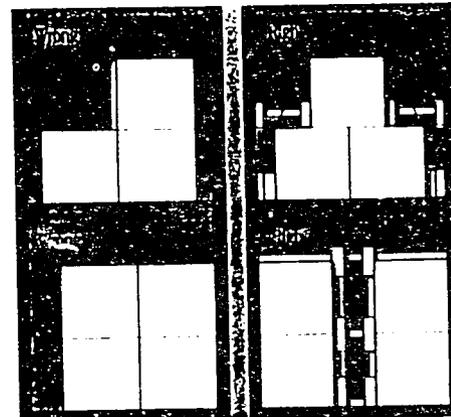
Isolate Cargo From Container/Trailer/Railcar Doors

Construct partition across rear of stowed cargo to prevent it from contacting doors and falling out when doors are opened.

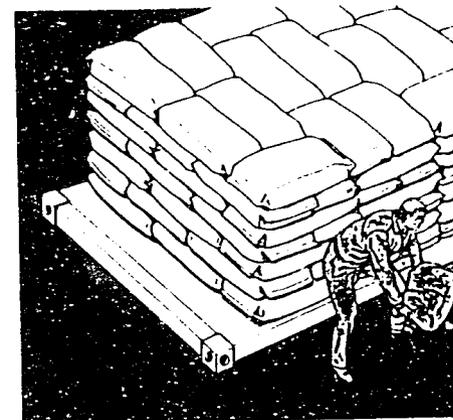
Provide Water Damage Protection

Cover cargo adjacent to doors with plastic or waterproof paper sheets to protect cargo from possible water ingress via door gaskets.

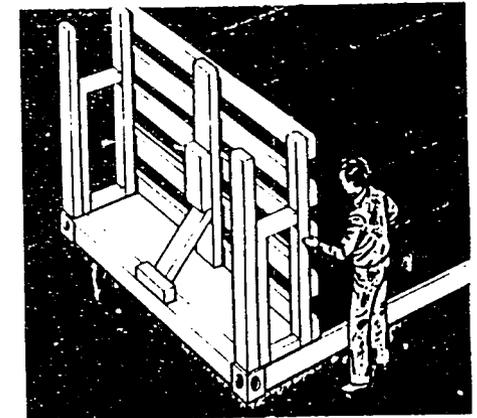
Close and Seal Doors Be sure all locking cams are engaged. Allix locks and seals. (On units with side and end doors -- be certain to check both.) Record seal number and enter on shipping documents.



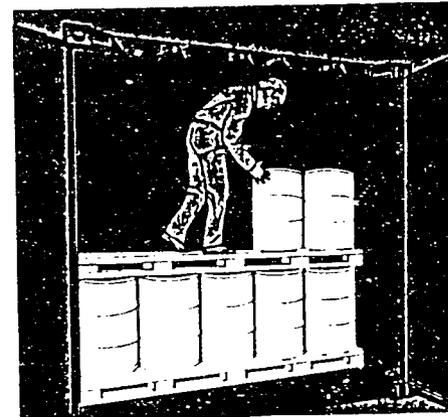
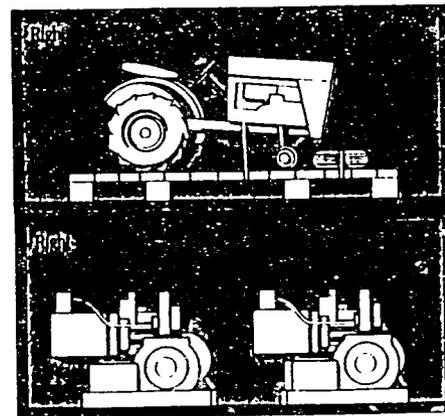
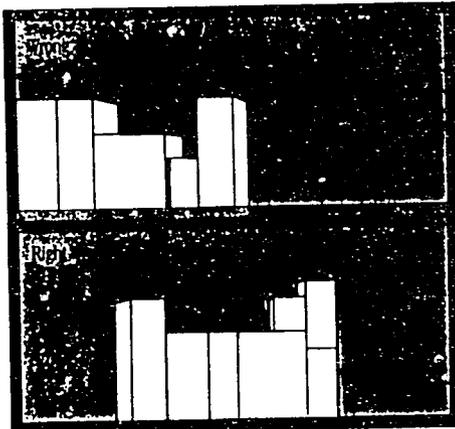
Weight Distribution — Heavy Loads



Bags and Sacks "Crossier" Loading



Bracing the completed load to prevent movement aft



BEST AVAILABLE DOCUMENT

CARGO SECURITY SEALS

As previously noted, once loaded, all intermodal and air cargo containers, trailers and railcars should be sealed. The particulars of a shipment, namely product type, value, marketability, susceptibility and routing/destination should be considered prior to seal selection. The most popular seal, usually constructed of polypropylene or galvanized tin plate can be breached and, even re-fitted, with basic tools. Stronger heavy duty cable seals or high security seal locks offer additional protection as they generally deter all but the most determined thief. In addition to deterring physical entry of the container, trailer or railcar, other desirable properties of seals include:

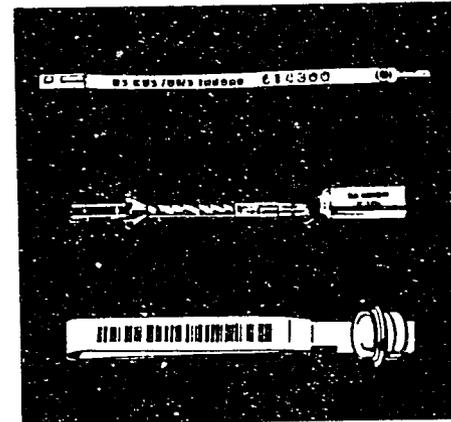
- Unique and clearly visible identity.
- Corrosion — resistance especially for those containers destined for ocean carriage
- Tamper-proofing so that it is impossible to re-fit.
- Strong enough to withstand accidental damage during handling/transit.

Technology has allowed for several sophisticated variations on these themes. Today, a shipper can choose from several seal types. There are bar-coded seals that enable automatic recording of seal numbers, indicator seals that release a bright dye into a transparent casing that is clearly visible from considerable distances and, at least, one manufacturer has developed a seal consisting of randomly set acrylic optical fibers jacketed in a high impact plastic body. These seals each have a unique "fingerprint" that can be verified by a specially designed camera

Regardless of the type seal used, its value is compromised if application is not properly supervised and it is not inspected at regular intervals during transit. Effectiveness is also only as good as the controls maintained over seal inventory. Seals should be stored in a controlled area and released to as few people as practical. A log indicating to whom seals identified by number, have been released, is a necessary control measure.

Through the years, the function of a seal has been to reveal evidence of entry. Given time, opportunity, and, in some cases, tools all can be defeated. Also, hijacking, the stealing of the entire trailer or container and contents, is a real potential. (With seals serving only to inconvenience the perpetrator[s]). In fact, in some areas of Africa, South America and Southern Europe, this is becoming a major concern.

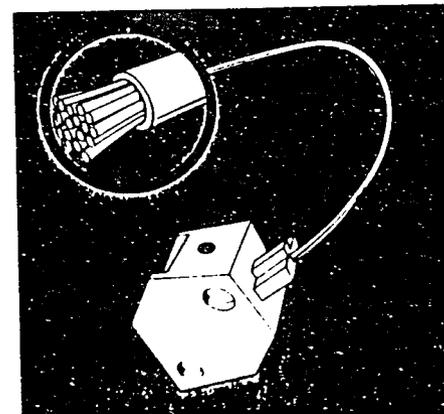
Aside from compliance with proven in-transit security procedures such as direct routing and convoying, vehicle/cargo tracking is a viable alternative given certain cost and geographical constraints. The global network of satellites and land-based terminals enables two-way messaging between a vehicle and a central location. This real time communication and periodic positioning capability has cargo security implications. Available system enhancement options include driver paging, vehicle diagnostics and refrigerated trailer monitoring.



Customs Seals



Stylized Indicator Seal



BEST AVAILABLE DOCUMENT

Streamlined and swift clipper ships were the fastest means of transport in the mid 19th century. Material goods and immigrants passed between continents at record speeds. The first time a company of North America visited their lands of 113

AIR CARGO

Air cargo service has become more attractive to shippers as aircraft capacity, frequency of lifts, handling facilities and the number of locations serviced have been increased.

Air cargo losses can be controlled with the shipper as the key figure in effective loss control. Recognition of the hazards involved, packing cargo to survive the toughest leg of the

journey and prudent selection of transportation services will assist the shipper in realizing successful loss-free delivery of his or her goods.

Inadequate packing and improper marking of cargo are the leading causes of air cargo losses. It is in these areas where the shipper can effectively influence the sound arrival of goods.

THE AIR CARGO ENVIRONMENT HAZARDS

In The Aircraft

Acceleration/Deceleration—Fore-and-aft pressures are exerted on cargo during takeoff and landing. Compression forces are exerted during rough landings.

Turbulence—Rough or "bumpy" flight conditions subject cargo to rapid alternating vertical movements, imposing heavier pressure one moment, and almost weightless conditions the next.

Altitude—As altitude increases, atmospheric pressure decreases, subjecting liquid cargo to leakage hazards and pressurized cargo to increased internal pressure.

Temperature—Aircraft cargo compartment temperatures normally range between 30°F and 70°F (-1°C and 21°C). However, cargo aboard an aircraft parked in freezing or very hot weather will be subjected to unusual cold or heat conditions.

Cargo Compartments—The main cargo compartments of air freighters are normally well equipped for adequate stowage. Passenger aircraft belly compartments, however, are often loaded with limited cargo restraint equipment permitting the possibility of movement during flight and inviting damage from adjacent cargo.

In Terminals

Handling—Many larger terminals are equipped with conveyor systems and mechanical cargo handling gear, permitting rapid and safe movement within the terminal. Manual handling involves the stacking of cargo on pallets and in containers. In smaller terminal facilities, it is the rule. Overcrowded conditions contribute to

above recommended heights or re-positioned frequently.

Storage—Modern terminals provide segregated security areas for high value cargo, and some have cold storage (reefer) facilities for perishables.

Terminals not so equipped are subject to increased theft, pilferage and deterioration loss hazards. Overcrowded conditions may also require storage of some cargo outdoors, exposing it to the elements.

Ramps—Cargo is exposed to the weather while enroute to loading ramps. If cargo transfer carts, pallets and containers are not adequately covered (tarped), water damage may result. High-value cargo is particularly susceptible to theft when not in the aircraft or the terminal.

Security—Security-conscious carriers provide maximum physical measures to protect cargo from theft or pilferage. Examples include restricting working areas to employees, applying modern locking and alarm devices and enforcing strict cargo documentation procedures. When these measures are not enforced, cargo security is jeopardized.

Dangerous Goods—Only trained personnel should handle this cargo. Consult appropriate publications for guidance such as the ICAO *Technical Instructions For The Safe Transport of Dangerous Goods by Air* or IATA *Dangerous Goods Regulations*.

On Trucks

Most cargo is delivered to both carrier and consignee by truck.

Often, air cargo is stored in ware-

housing, increasing exposure to theft, pilferage and handling damage.

INSIST UPON PROMPT PICKUP AND DELIVERY OF YOUR CARGO! This is the most effective means of reducing exposure to loss.

Preparing Cargo For Air Shipment/Pack For The Toughest Leg Of The Journey: Trucking to air terminal, handling in terminals, stowing in aircraft, inflight, unloading aircraft, transfer to terminals, truck transport to consignee.

Cargo Should Be Packed To Withstand: Stacking up to 8 feet high, pressure from adjacent cargo, crushing action of tie-down straps, manual handling, exposure to the elements.

Unitize, Palletize, Containerize To: Minimize manual handling, reduce incidents of lost or stray items, limit exposure to theft and pilferage, and minimize stowage damage. Provide water-protective coverings, which will accompany pallet and unit loads on entire journey.

Liquid Cargo

Do not fill containers completely—Provide expansion space to compensate for temperature and/or pressure variations. Be sure all caps, valves and seals are tightly closed. Put orientation marks (arrows) on all sides of package.

Large, Heavy or Awkward Cargo

Check with carrier to determine allowable aircraft floor weight concentrations.

Provide skids for ease of mechanical handling.

Check dimensions to be sure cargo will pass through aircraft loading doors.

Provide adequate locations for application of tie-down straps.

Water Damage Protection

Pack cargo in wooden crates with waterproof paper or polyethylene liners.

Line non-impregnated fiberboard boxes with waterproof paper or polyethylene.

Large items can be shrouded with polyethylene sheeting. Be sure there are drain holes in the base of the crate.

Use desiccants (moisture absorbent materials) in conjunction with waterproof barrier wrapping when packing moisture sensitive items.

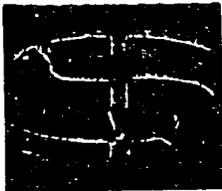
Use shrink wrap, stretch wrap or plastic shrouds on unit and pallet loads.

Perishable Cargo

Provide adequate package ventilation where required. Furnish appropriate instructions i.e., carrying temperatures and handling requirements, to carriers. Use direct flights where possible. Delivery and pick-up should be closely timed with aircraft departure and arrival.

Marking

Avoid marks and advertising that reveal contents are of a valuable or desirable nature. Apply appropriate coded identification marks to at least three sides of item. Use international handling symbols. Include handling instructions in both English and the language of the country of destination. Use indelible inks and waterproof labels.



AIR CARGO CONTAINERIZATION

Shippers can realize savings and minimize cargo loss by containerizing their air cargo shipments. Airlines encourage use of containers by providing special tariffs for containerized FAK (Freight-All-Kinds) shipments on many routes.

Certain commodities are excluded from air cargo FAK special rates. Consult with your carrier or forwarder for specifics on excluded items and on articles prohibited by IATA's *Dangerous Goods Regulations*.

Air carriers prefer containerized shipments for a number of reasons:

Reduces the number of individual pieces of cargo that must be handled in terminals.

Provides for most efficient use of cubic capacity of the aircraft.

Permits use of mechanical handling systems and equipment to best advantage.

Speeds loading and unloading of aircraft.

Minimizes exposure of cargo to weather, theft, pilferage and handling damage while in custody of the carrier.

Air Cargo Containers Fall into Four Basic Categories

1. Air Cargo Pallets

Designed for use with conveyor systems in terminals and in aircraft. The low-profile flat pallet is equipped with fittings for securing the pallet firmly to the main deck of an all-cargo aircraft. Cargo is normally secured to the pallet by use of cargo nets, tightened over cargo by the application of tensioned straps.

2. Contoured Air Cargo Containers

Contoured, semi-structural covers called Type "A" are used to provide protection for cargo and keep cargo within safe dimensions for loading in aircraft.

These containers may have one side (front) open, with cargo secured by nets or have metal or fiberglass removable doors, which are capable of being sealed.

3. Lower Deck Containers

Developed for use in the lower deck cargo spaces of high-capacity aircraft, they are fully structured and completely enclosed.

Cargo is loaded into the container, which may be equipped with shelves for accommodation of small or irregularly shaped cargo.

The container doors of metal, fabric or a combination of both are closed and sealed.

Containers are locked directly into aircraft restraint systems without need for nets or tie-downs. Provide dunnage or shelving to prevent crushing of cargo at recessed end of lower deck container.

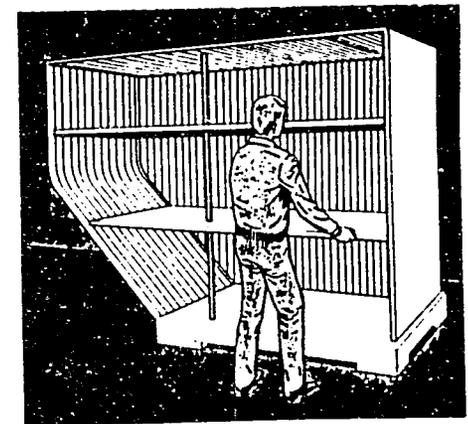
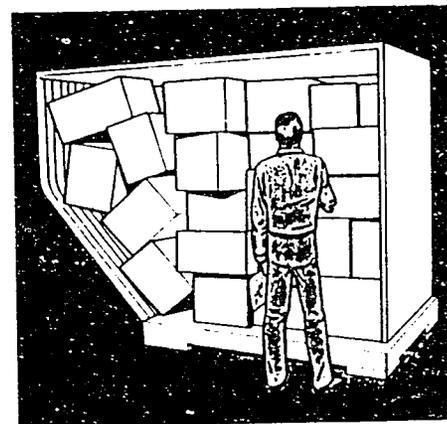
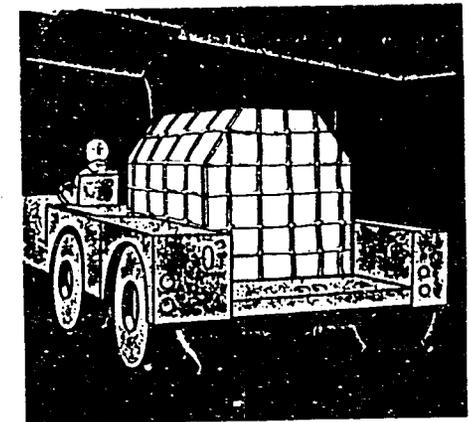
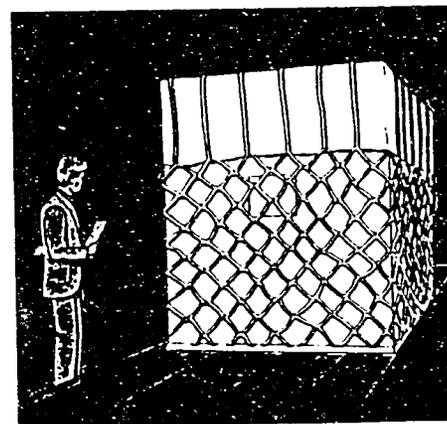
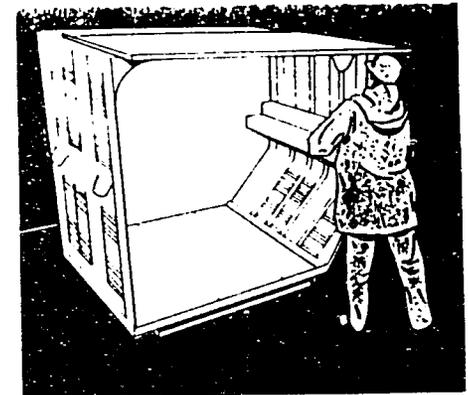
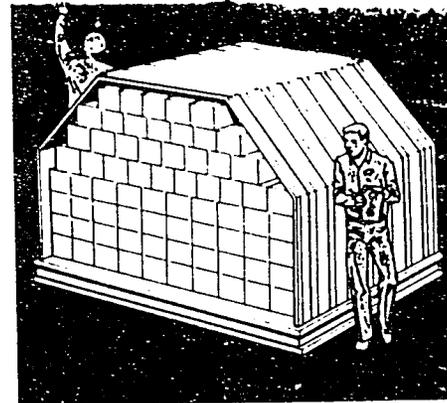
4. Box-Type Containers

Developed in standard sizes to facilitate establishment of uniform shipping rates, they are used to consolidate shipments.

Box-type containers are often used by freight forwarders to consolidate shipper's cargo into one easily handled and rated unit.

These containers are constructed of wood, fiberglass, plywood, fiberboard, metal or combinations of these materials.

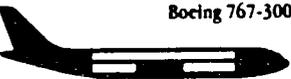
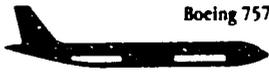
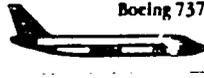
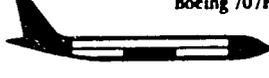
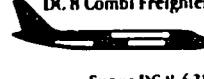
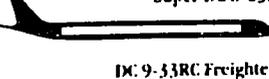
Air/Land Containers — Introduction of the 747-class freighter has permitted adding an air dimension to the intermodal container. Lightweight 20- and 40-foot containers permit land and air transportation without rehandling or reloading.



Provide dunnage or shelving to prevent crushing of cargo in contoured end of lower deck container

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Aircraft Capacities and Dimensions

	Airbus A-300C	Main deck Forward Aft	7,169 cu ft - 203 cu m 1,896 cu ft - 53.7 cu m 1,264 cu ft - 35.81 cu m	111,763 lbs-50,695 kgs (total freight capacity)	101" × 141"-257cm × 358cm 95 9" × 67 5"-243cm × 171cm 71 3" × 67 4"-181cm × 171cm
	Boeing 767-300	Main deck Forward Aft	3,600 cu ft - 101.9 cu m	69,850 lbs-31,684 kgs	AFT 70" × 69"-178cm × 175cm
	Boeing 757	Forward Aft	700 cu ft - 19 cu m 1,090 cu ft - 30 cu m	25,700 lbs-11,657 kgs (total freight capacity)	FWD 55" × 44"-140cm × 112cm AFT 55" × 44"-140cm × 112cm
	Boeing 747C	Main deck Forward hold Aft hold Bulk compartment	9,145 cu ft - 259 cu m 2,225 cu ft - 63 cu m 742 cu ft - 21 cu m 1,271 cu ft - 36 cu m 800 cu ft - 23 cu m	92,000 lbs-41,500 kgs 55,500 lbs-25,175 kgs 20,400 lbs- 9,250 kgs 22,600 lbs-10,280 kgs 14,800 lbs- 6,750 kgs	134" × 120"-340cm × 305cm 104" × 66"-264cm × 168cm 104" × 66"-264cm × 168cm 44" × 47"-112cm × 119cm
	Boeing 747F	Main deck Forward Aft Bulk compartment	21,270 cu ft - 602 cu m 2,528 cu ft - 72 cu m 2,212 cu ft - 63 cu m 800 cu ft - 22.6 cu m	260,000 lbs-117,936 kgs (total freight capacity)	134" × 123"-340cm × 312cm 104" × 68"-264cm × 173cm 104" × 68"-264cm × 173cm 44" × 47"-112cm × 119cm
	Boeing 737	Main deck Forward Aft	2,730 cu ft - 77.3 cu m 875 cu ft - 24.8 cu m	39,000 lbs-17,687 kgs (total freight capacity)	134" × 84 5"-340cm × 214cm
	Boeing 707F	Main deck Forward Aft	8,000 cu ft - 227.2 cu m 875 cu ft - 24.9 cu m 910 cu ft - 25.8 cu m	90,000 lbs-40,824 kgs 14,300 lbs- 6,486 kgs 13,900 lbs- 6,305 kgs	134" × 86 6"-340cm × 224cm 48" × 50"-122cm × 127cm 48" × 48"-122cm × 122cm 35" × 30"-39cm × 76cm (smaller rear door)
	Boeing 727-100C	Main deck Forward Aft	3,300 cu ft - 93 cu m 420 cu ft - 11.9 cu m 470 cu ft - 13.3 cu m	37,960 lbs-17,236 kgs (total freight capacity)	86" × 134"-224cm × 340 cm 48" × 35"-122cm × 89cm 48" × 35"-122cm × 89cm
	DC 10-30CF	Main deck Forward hold Aft hold Bulk compartment	12,236 cu ft - 346 cu m 2,155 cu ft - 61 cu m 1,413 cu ft - 40 cu m 459 cu ft - 13 cu m	84,865 lbs-38,495 kgs 56,000 lbs-25,401 kgs 35,000 lbs-15,875 kgs 7,480 lbs- 3,400 kgs	102" × 140"-259cm × 356cm 104" × 66"-264cm × 168cm 70" × 66"-178cm × 168cm 30" × 36"-76cm × 91cm
	DC HF Jet Freighter	Main deck Forward hold Aft hold	5,092 cu ft - 144.2 cu m 688 cu ft - 19.5 cu m 724 cu ft - 20.5 cu m	84,790 lbs-38,000 kgs 10,320 lbs- 4,690 kgs 10,470 lbs- 4,760 kgs	140" × 85"-356cm × 216cm 36" × 44"-91cm × 112cm 36" × 44"-91cm × 112cm
	DC H Combi Freighter	Forward cabin Forward hold Aft hold	1,600 cu ft - 45.2 cu m 688 cu ft - 19.5 cu m 724 cu ft - 20.5 cu m	8,000 lbs-3,600 kgs 10,320 lbs-4,690 kgs 10,470 lbs- 4,760 kgs	140" × 85"-356cm × 216cm 36" × 44"-91cm × 112cm 85" × 140"-216cm × 356cm
	Super DC 8-63F	Main deck Aft	10,331 cu ft - 293 cu m 2,500 cu ft - 71 cu m	119,000 lbs-54,000 kgs (total freight capacity)	85" × 140"-216cm × 356cm 64" × 54"-164cm × 137cm
	DC 9-33RC Freighter	Cabin Forward hold Aft hold	2,680 cu ft - 76 cu m 420 cu ft - 11.9 cu m 318 cu ft - 9 cu m	53,297 lbs-24,155 kgs 6,952 lbs- 3,160 kgs 5,000 lbs- 2,265 kgs	113" × 81"-341cm × 204cm 53" × 50"-135cm × 127cm 46" × 50"-91cm × 127cm

		Cubic capacity	Maximum freight capacity	Access door dimensions
	DC 9-15 Forward hold Aft hold	373 cu ft - 10.5 cu m 227 cu ft - 6.4 cu m	5,595 lbs - 2,538 kg 3,403 lbs - 1,544 kg	53" × 50" - 135cm × 127cm 36" × 50" - 91cm × 127cm
	L1011-500F Main deck Lower deck	12,060 cu ft - 342 cu m 3,315 cu ft - 98 cu m	146,500 lbs - 66,518 kg (total freight capacity)	134" × 100" - 340cm × 254cm
	MD-88 Main deck Aft	1253 cu ft - 35.5 cu m	18,795 lbs - 8,525 kg	FWD 48" × 34" - 122cm × 86cm AFT 48" × 35" - 122cm × 89cm

The adjacent table lists standard air cargo containers. Minor variations in internal dimensions and cube will occur due to differences in the construction techniques and materials used.

Air cargo is a popular mode of transportation for live animal shipments. Consult individual airlines for specific requirements and restrictions. Equally important, check on the import regulation and quarantine laws that affect shipments.

Air Cargo Containers. The following is a brief description of the various containers used.

External Dimensions (Inches)	Maximum Gross Weight (lbs.)	IATA	ATA
125 × 96 × 96	15,000	ARA	M 1
240 × 96 × 96	25,000	ASE-ASG	M 2
88 × 125 × 87	13,300	SAB-UAB	A 1
88 × 125 × 87	12,500	AAA-SAA	A 2, A 3
81 × 60.4 × 62.75	4,500	---	FTC
47 × 60.4 × 64	2,700	APA	LD2
79 × 60.4 × 64	3,500	AE-AKE	LD3
96 × 60.4 × 64	5,100	DLP-DLF	LD4
125 × 60 × 64	7,000	AWB-AWD	LD5, LD11
25 × 60.4 × 64	5,680	AWC-AWF	LD6
125 × 88 × 64	13,300	AAP-AAR	LD7, LD9
196 × 60.4 × 60	5,400	AJE	LD8
125 × 60.4 × 64	5,680	AWR-AWS	LD10
98 × 42.2 × 41.6	1,700		LD9A
84 × 58 × 76.45	5,000		B
42 × 58 × 76.45	2,500		B2
58 × 42 × 45	2,000		D
42 × 29 × 25.5	500		L
45.4 × 21 × 21	250		E11
56 × 55 × 57	3,160		LD-N
39.5 × 27.5 × 21	400		Q

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interior blocking to hold the contents in place, thus allowing the container to be turned on its side or upside down. The following recommendations should be considered in selecting the nailed wood box:

1. Boxes should be made up of seasoned lumber with moisture content between 12 percent and 19 percent. Knots should not be over one-third the width of the board, and specifically should not interfere with nailing. Severe cross graining should also be avoided.

2. Consult appropriate tables for selection of proper sizes of lumber and nails. Boxes with two or four cleats on each end are particularly recommended for overseas shipment.

3. Many a well-designed box fails because the load is not properly fitted or secured. If necessary, use proper blocking and bracing to adequately secure the load. A properly fitted or secured load should not move when the box is roughly handled. If the load must be kept upright, equip the box with lift handles, skids, top peaks, gables or some similar devices to assure the box being stowed and handled is in an upright position. **AVOID OVERLOADING.**

4. Reinforce the box with adequate tension metal straps placed one-sixth of the distance from the ends, unless boxes are in excess of 48 inches in length or over 250 pounds. Then, three or more straps should be used, with one for each additional 24 inches. Staples should be used to hold strapping in place when boards are five-eighths of an inch in thickness or greater.

Lumber and Nail Tables for Nailed Wood Boxes

Weight of Contents (Pounds)		Number of End Cleats	Softwood		Hardwood		
Over	Less		Thickness Sides, Top & Bottom	Thickness Ends	Thickness Sides, Top & Bottom	Thickness Ends	
Load Supports Container Walls							
0	50	2	3/8	3/8	3/8 x 1 1/2	3/8	3/8 x 1 1/2
		4	3/8	3/8	3/8 x 1 1/2	3/8	3/8 x 1 1/2
50	100	2	1/2	1/2	1/2 x 2 1/2	3/8	3/8 x 1 1/2
		4	1/2	1/2	1/2 x 2 1/2	3/8	3/8 x 1 1/2
100	250	2	3/4	3/4	3/4 x 2 1/2	1/2	3/8 x 2 1/2
		4	3/4	3/4	3/4 x 2 1/2	1/2	3/8 x 2 1/2
250	400	2	1	"	1 x 2 1/2	1/2	1 x 2 1/2
		4	1	"	1 x 2 1/2	1/2	1 x 2 1/2
400	600	4	1 1/8	"	1 1/8 x 2 1/2	3/4	1 x 2 1/2
500	800	4	1 1/8	1 1/8	1 1/8 x 3 1/2	1 1/8	1 1/8 x 3 1/2
800	1,000	4	1 1/8	1 1/8	1 1/8 x 4 1/2	1 1/8	1 1/8 x 4 1/2
Load Gives Little or No Container Support							
0	50	2	1/2	1/2	1/2 x 2 1/2	3/8	3/8 x 1 1/2
		4	1/2	1/2	1/2 x 2 1/2	3/8	3/8 x 1 1/2
50	100	2	3/4	3/4	3/4 x 2 1/2	1/2	3/8 x 2 1/2
		4	3/4	3/4	3/4 x 2 1/2	1/2	3/8 x 2 1/2
100	250	2	1	1 1/8	1 1/8 x 3 1/2	1 1/8	1 1/8 x 2 1/2
		4	1	1 1/8	1 1/8 x 3 1/2	1 1/8	1 1/8 x 2 1/2
250	400	2	1 1/8	"	1 1/8 x 3 1/2	1 1/8	1 1/8 x 2 1/2
		4	1 1/8	"	1 1/8 x 3 1/2	1 1/8	1 1/8 x 2 1/2
400	600	4	1 1/8	1 1/8	1 1/8 x 3 1/2	1 1/8	1 1/8 x 2 1/2
600	800	4	1 1/8	1 1/8	1 1/8 x 3 1/2	1 1/8	1 1/8 x 2 1/2
800	1,000	4	1 1/8	1 1/8	1 1/8 x 3 1/2	1 1/8	1 1/8 x 3 1/2

Measurements in inches

Nails

Cement coated nails are preferred for their increased withdrawal resistance. The size of the nail depends on the thickness of the wood receiving the point (see chart). Use 6d for 3/8", 7d for 1/2", 8d for 3/4", 9d for 1 1/8" and 12d for 1 1/8". Do not use nails into wood less than 3/8". Spacing of nails varies with the size of the nail. Space 6d 2", 7d 2 1/2", 8d 2 1/2", 9d 2 1/2" and 12d 3 1/2". (If nailing into end grain, reduce spacing by 1/2") Avoid end-grain nailing if possible.

Wood

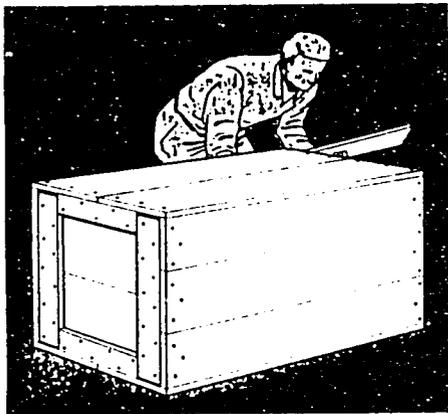
Fir, pines, cedar, hemlock and larch are lower density woods. The higher density wood category includes ash, elm, cherry, oak, hard maple and hickory.

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5. DO NOT USE SECOND-HAND BOXES. They are deficient in strength and do not permit detection of pilferage.

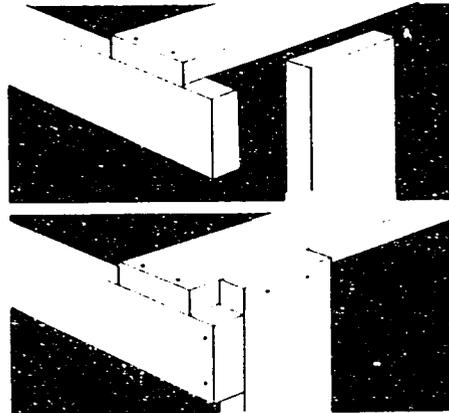
6. Boxes should be equipped with corrugated fasteners or similar devices where contents are substantially valued and susceptible to pilferage.

7. Boxes should be lined with a waterproof barrier material sealed at the edge with a waterproof tape or adhesive to protect both the contents and the interior packing material.

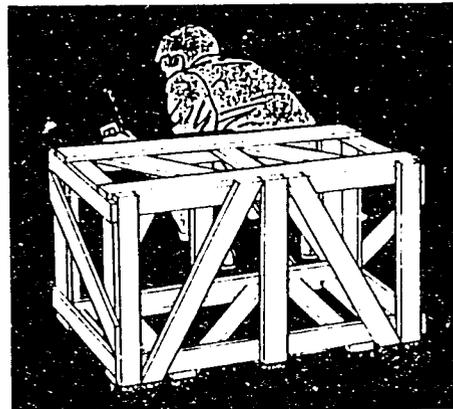
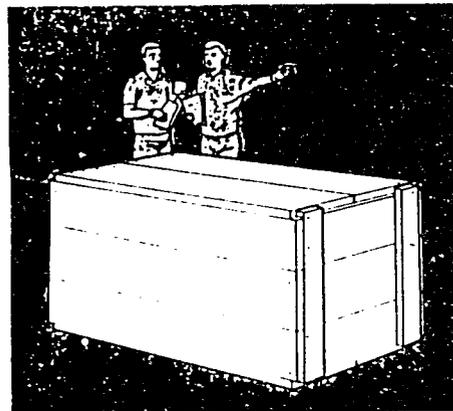


Crates

There are two general types of crates – the open or skeletal crate and the fully sheathed crate. Both types are dependent upon properly constructed frameworks. While the drawings below illustrate the comparative strength of frame members of open crates under vertical compression, the same principles apply to sheathed crates, as they also require diagonal bracing to make them rigid. Keep in mind that sheathing is provided to protect against exposure to the elements. The open crate can be used where contents are virtually indestructible, and packing is



A 3-way corner is the strongest, most rigid corner construction for a crate.



required only to facilitate handling and stowage. It also serves well as an overpack to consolidate fiberboard boxes or to provide unit pack stiffness to resist crushing. Three-way corner construction should be reinforced with diagonals.

Consider these points in sheathed crate construction:

1. Provide a SUBSTANTIAL framework, i.e., corner posts or vertical end struts, edge or frame members, intermediate struts and diagonal braces.

2. Large crates are usually stowed in the lower holds, hence they must bear great superimposed weights. Ensure top strength by frequent top joists under sheathing (never more than 30 inches apart). DON'T depend on end grain nailing ALONE to hold these joists. Supplement with back-up cleats.

3. Reinforce floor at load-bearing points.

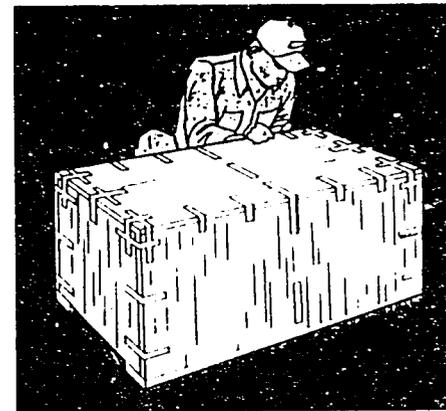
4. Design sides and ends for vertical sheathing.

5. On skid type crates terminate end sheathing at flooring to permit entry of forklifts. Terminate side sheathing 1/2 inch short of skid bottoms to prevent tearing away of sheathing when crate is dragged sideways. The use of rubbing strips facilitates handling by forklift trucks.

6. On sill type crates provide lengthwise rubbing strips at base to facilitate handling and prevent tearing or lift of sheathing when the crate is dragged.

7. Where skids are used, be sure they are of sufficient dimensions and an adequate number provided. Skid ends should always be cambered, sling points provided and marked to facilitate vessel loading/discharge.

8. Reduce cube and interior bracing problems by providing maximum disassembly of the carried item. Spares and disassembled parts should be adequately secured to crate interior. In doing so aim at a low center of gravity.

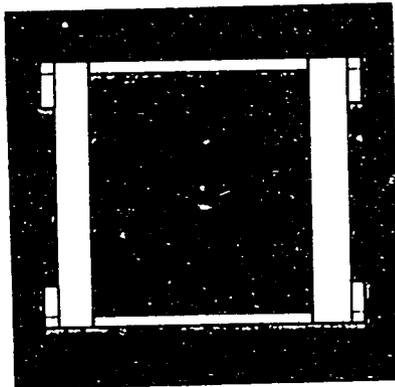


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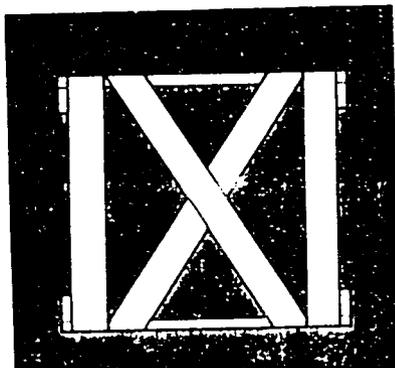
9. Line crate interior (except bottom) with a good grade waterproof barrier material. Ventilate crates containing machinery or other items susceptible to damage from condensation with baffled vents or louver plates at ends or sides. Also, space floor boards $\frac{1}{8}$ inch apart.

10. Corners of all crates should be reinforced with lengths of 1 inch flat nailed strapping applied so as to tie together all faces at each corner.

11. Assure yourself that handling facilities are available for your crate at destination and at intermediate points. Provide consignee with opening instructions to reduce accidental damage during unpacking.



1100
Units



1150

Wirebound Crates and Boxes

Wirebound boxes and crates have shown themselves useful for a large variety of products not affected by minor distortions of the unit and as overpacks for solid or corrugated fiberboard boxes (cartons). If the wirebound container is not completely filled, properly applied interior blocking and bracing is recommended. The ends of wirebound containers should be reinforced to adequately resist forces that may be applied during handling thus preventing damage to contents. Shippers should AVOID OVERLOADING and should not use boxes too large for their contents. Other considerations are:

1. Veneer and cleats should be full thickness, straight grained and sound, free from knots, decay, mildew or open splits. Knots not more than 1.5 inches in diameter and less than one-third the width of the piece of veneer are allowable. Wire should be free from rust and scale.

2. Ideal staple spacing is 2.5 inches on crates; 2 inches on boxes. A minimum of two staples per slat is recommended.

3. Observe care in effecting closures to avoid wire fatigue. Use special closure tools.

4. Consult appropriate tables and your box supplier for export specifications.

5. Where contents are susceptible to pilferage or exceed 150 pounds, apply one tension strap lengthwise around top, bottom and ends. If over 250 pounds, apply two girthwise straps within 3 inches of each end. Also, consider applying straps over intermediate cleats.

6. Line box interior with a good grade waterproof barrier material and properly seal.

Cleated Plywood Boxes

Properly assembled and used, cleated plywood panel boxes have many uses in foreign trade. Their lightness and comparative strength particularly recommend them for air cargo shipments. Shippers may abuse these containers by using second-hand units, overloading, applying strapping improperly, allowing long unsupported panels or failing to properly nail the box closed. Thin panels invite damage to contents through punctures. Follow these points:

1. Consult appropriate tables to avoid overloading, to determine proper nail spacing and to find correct dimensions of plywood and cleats. NEVER USE SECOND-HAND BOXES.

2. Reject rotted, split or otherwise defective cleats.

3. Apply intermediate cleats to all panels in excess of 24 inches.

4. Apply strapping only over edge and/or intermediate cleats for maximum support. Strapping that spans unframed areas is easily broken and may injure cargo handlers. Use stapling to hold banding in place on cleats.

5. Don't overlook lining with adequate waterproof or vaporproof barrier material, where contents are susceptible to wetting damage.

Steel Drums

New steel drums are generally excellent for export. Second-hand drums, unless thoroughly reconditioned and tested, may give trouble because of fatigue caused by dents at the chime and previous damage to the closures. Also consider the following:

1. Closures must be made as prescribed by the manufacturer. Back up friction type covers of drums, as well as cans or pails, with soldering or spot welding at three or more points.

2. Be sure adequate seals are used on locking levers and sealing rings of open end drums. Failure of seals may result in accidental opening of covers.

3. Consider use of tamperproof seals at filling and dispensing holes.

4. Make frequent spot checks of automatic filling machinery by weighing filled drums. Shortages may occur at the source.

5. Do not re-use single or one trip containers.

6. For hazardous materials/dangerous goods, be sure the drums meet DOT/IMO/ICAO or appropriate standard-making group specifications, and are properly labeled for carriage of the intended cargo.

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Fiber Drums

Fiber drums are gaining importance in the export picture. Before using them determine that open storage enroute is not contemplated. Considerations for fiber drums include:

1. High density materials should not be packed into fiber drums
2. Fiber drums should be filled to the top in order to add rigidity to the package. Use smaller drums if contents are such that weight limits will be exceeded if filled to the top. Avoid empty spaces at the top of the drum.
3. It is advisable to settle or deaerate materials—particularly light fluffy powders—during the filling operations. Use of a vibrator or mechanical settler is recommended. Bag-lined drums can be deaerated simply by manually compressing the filled bag.
4. Keep size of drum compatible with weight of contents to avoid overloading
5. Closures are important. Be sure sealing rings and locking levers are properly in place and will not be accidentally jarred or pulled loose.
6. Handle with mechanical equipment or roll on bottom chimes. Fiber drums are not designed to roll on sidewalls. Avoid cutting, denting and chafing of sidewalls as stacking strength will be lost.
7. If possible, palletize fiber drums to facilitate mechanical handling in warehouses or on docks.

Barrels, Casks or Kegs

The wooden barrel has been a workhorse of overseas trade, dating back to ancient times. Selection of the wrong barrel for your product can result in leakage, contamination, breakage and many other headaches. The following are basic recommendations:

1. Tight (liquid) barrels should be stored bung up. Request stowage on bilges. Slack (dry) barrels should be stored on ends. Never store or ship slack barrels on their sides.
2. Provide reinforcing head cleats running from chime to chime at right angles to headpieces. Cleat thickness should never be greater than chime depth.
3. Use tongue and groove staves with a suitable liner where contents, such as dry chemicals and powders, may sift. Make sure barrel wood and liner material will not contaminate contents.
4. Keep voids in slack barrels to a minimum. Use headliners (strips of coiled elm fastened inside chime) to give barrel heads added strength.
5. Where tight barrels are employed, hoops should be fastened with not less than three fasteners (dogs) per hoop. Provide for inspection at interim transit points, where practicable, to check for leakage. If contents are carried in brine, re-brining at interim points may save contents of leaking units.

Multi-Wall Shipping Sacks

Multi-wall shipping sacks or bags are being used more and more for packaging of powdered, granular and lump materials, particularly dry chemicals. These sacks are flexible containers generally made up from two walls or plies of heavy-duty kraft paper to a maximum of six. Often, they are made in combination with special coatings, laminations, impregnations or even textile material such as burlap to give them additional strength and added protection to their contents. Because of the flexibility of these containers, special attention must be given to the use of flexible waterproof or moistureproof materials in their construction.

There are several types of bags used, the most common being the pasted bottom or sewn bottom open-mouth, and the pasted valve or sewn valve. The pasted bottom and sewn bottom open mouth type bags are closed after filling, by sewing through all plies with a strip of tape incorporated into the sewn end in such a way that it folds over the end to control sifting. They can also be closed by gluing. The valve type bags are closed by manually folding over an external paper sleeve or by the check valve action of an inner paper sleeve when the bags are full. The internal pressure of the contents causes this, and care must be taken that the bags are sufficiently filled to exert this pressure. It must be recognized that slight leakage will nevertheless occur, particularly when the bags are handled.

The use of these bags for overseas shipments should be limited. These bags must be adapted to the requirements of the commodity it contains. This requires careful research and intelligent selection. It is

recommended that the loaded bag not exceed 50 pounds. Thought must be given to the value of the product as well as to its hygroscopic properties and chemical and physical characteristics. Utmost consideration must be given to in-transit hazards, such as atmospheric conditions or exposure to the elements, number of transfers and handlings and warehouse facilities. Of major importance is the question as to whether the contents of the sack will be subjected to contamination if the bags are ruptured or if foreign matter can filter in through stitching holes.

A good practice for the shippers is to include a supply of open mouth refill or overslip sacks with each shipment.

The number of refill sacks should not be less than 1 percent of the number of sacks in the shipment and preferably 3 percent. The refill sacks should be imprinted with instructions for their use as well as identification of the commodity that they will carry. Overslip sacks should be slightly larger than the original sack and constructed of the same number and kind of plies.

Palletizing of a number of sacks, adequately shrink-wrapped and/or banded to the pallet, has been particularly effective in reducing damage and pilferage, and forces use of mechanical handling equipment.

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Bales

A well-made bale may be expected to outturn reasonably well in most export trades. Bear in mind, however, that all bales are subject to pilferage, hook holes and water damage. They are, therefore, not recommended for highly valued commodities. To minimize losses, follow these recommendations:

1. Use a primary wrap of fiberboard material where contents may be subject to damage from strapping pressure.
2. Use an inner wrap of creped or pleated waterproof paper. This type of paper is necessary to provide moisture protection and to give with bale distortions without tearing.
3. Provide heavy outer wrap of burlap or similar cloth able to withstand heavy abrasions in transit.
4. Provide "ears" at corners of small bales to facilitate handling without hooks. Bale weights under 100 pounds are less apt to be handled with hooks.
5. A minimum of four flat tension bands should be used. Apply tightly at the maximum bale compression to avoid slipping of end bands.
6. Stencil all shipping and cautionary marks on bale. Do not use tags as these can easily be torn off during normal handling.

Flexible Intermediate Bulk Containers (FIBCs)

These containers, a combination of packaging materials and a lifting system, can be used in the transportation of most granular and powder commodities. They should have a capacity not in excess of three cubic meters and/or a gross weight of 3,000 kg and be fitted with integral or detachable devices for lifting/suspension.

FIBCs are manufactured from a fabric or woven polymer, polypropylene, polyethylene, polyester or polyamide; the latter two for use in multi-trip containers where they are expected to encounter arduous conditions. The fabric is made up into a cuboid or cylindrical container stitched with man-made fiber or twine. Some heavy-duty units have welded seams.

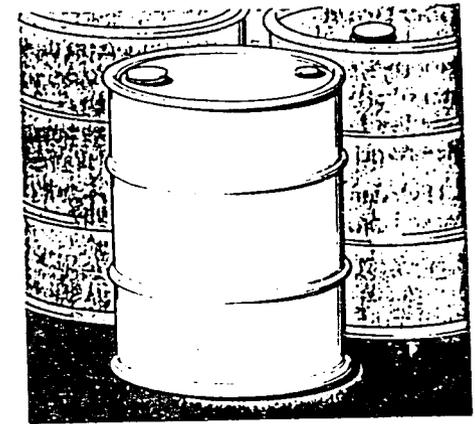
Some flexible containers have disposable polyethylene liners that are used to prevent product seepage and improve watertightness. These liners can also preclude cleaning and extend the life of re-usable containers.

The means of filling are fitted to the top usually in the form of a flexible spout, some types have open tops. Similarly, a discharge fitting such as another spout is located at the bottom of the container. Provisions are made to protect the discharge arrangement from dust often by a thumb spout or use of a protective flap.

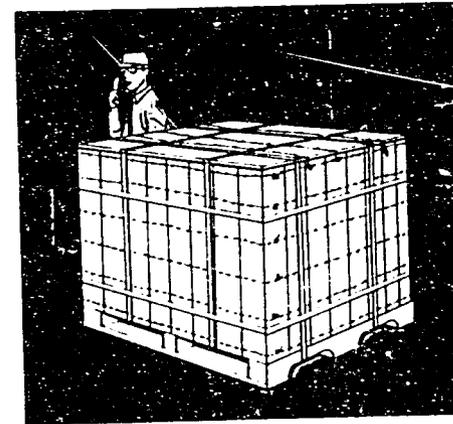
FIBCs should be inspected prior to each use, checked for abrasions, cuts, contusions, ultraviolet degradation and/or chemical attack evidenced by weakening, softening or discoloration of the material and damage to coatings. These could lead to possible contamination of contents with unacceptable levels of coating fragments or increased chance of moisture contact.

Additional safe handling points include:

- check for test certificate that indicates the FIBC is an approved type
- ensure the filled FIBC is stable
- close the top inlet correctly
- protect containers from rain and/or prolonged sunlight
- ensure stability when stacking FIBCs
- secure the containers adequately for transportation



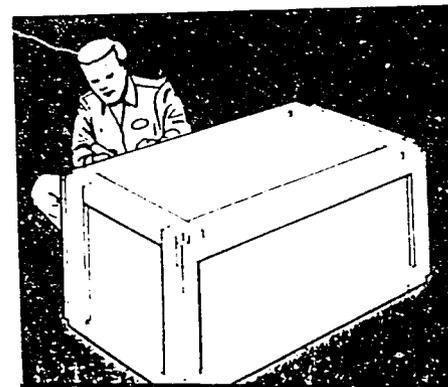
Steel Drums



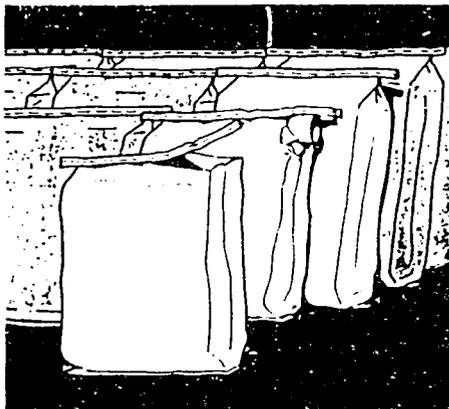
Wirebound Boxes and Crates



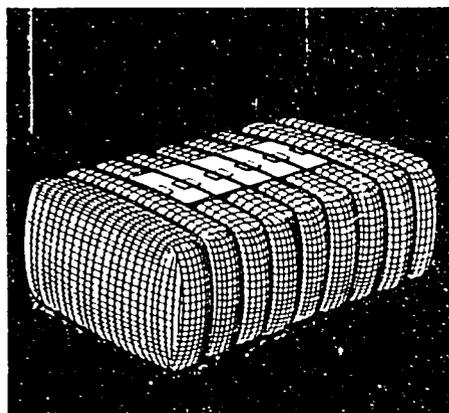
Fiber Drums



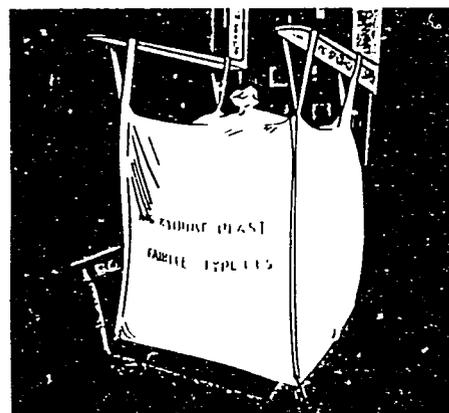
AVAILABLE DOCUMENT



Multi-Wall Shipping Sacks



Bales



Flexible Intermediate Bulk Containers

Cushioning

Certain types of cargo must be suspended or protected against shock and vibration by a cushion that gradually increases resistance against item movement.

Selection of the correct cushioning material depends on the item's fragility, measured in "Gs" or the maximum deceleration it can withstand without damage, overall dimensions, weight, shape, surface finish and built-in shock re-

sistance. Other considerations include anticipated drop heights based on handling and transportation environment. Many cushioning material suppliers provide performance data with their products.

Cushioning Materials and Characteristics

Cushioning Characteristics (1)

Type Material	Abrasion Resistance	Resilience	Compression	Absorption	Water Resistance	Dusting(2)	Damping Quality(3)	
Expandable Polystyrene (EPS)	Good	Medium	High	Low	High	Low	Low	(1) These ratings are general in nature. Any characteristics can be varied in a customized mode.
Cellulose	Good	Medium	High	(4)	(4)	High	Excellent	(2) Dusting describes the extent of material breakdown in small or dustlike particles in transit.
Wood Excelsior	Poor	Medium	High	High	(4)	High	Good	(3) Damping quality reflects the ability of the material to progressively diminish vibrations or oscillation.
Hair Felt	(5)	Medium	Low	(5)	(5)	Low	Poor	(4) This material is manufactured under different specifications that vary the degree of named characteristics but generally is susceptible to moisture.
Solid/Corrugated Fiberboard	Poor	Medium	Low	Low	High	High	Poor	(5) Used mainly as padding for large and heavy items. Often glued in place.
Wax Shredded Paper	Poor	Low	High	High	Low	High	Excellent	(6) This is a foam-in-place material that can vary in make-up to meet requirements.
Cellular, Plasticized, Polyvinyl Chloride	(4)	High	Low	Nil	High	Low	Good	(7) This material is available with anti static and/or fire retardant additives.
Polyurethane (Fab or Molded)	Good	(8)	(8)	(8)	Low	Low	(8)	(8) This material can be manufactured to varying specifications to meet shipment needs.
Polyurethane Foam (6)	Good	(6)	(6)	(6)	Low	Nil	(6)	
Polyethylene Foam (7)	Fair	High	High	High	High	Low	Good	
Latex Foam Sponge Rubber	Good	High	Low	High	Low	Low	Fair	
Paper Honeycomb				Energy dissipating medium only				

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UNIT LOADS

Many commodities can be economically palletized or unitized to facilitate their handling, stowage, and protection. Often, packing costs can also be significantly reduced. Pallet and unit loads offer the following additional advantages:

- Requires use of mechanical handling equipment and reduces the manual handling damage hazard since it eliminates the multiple handling of individual items
- Reduces opportunity for pilferage and theft and permits early detection of tampering

- Speeds loading and unloading of trailers, box cars, intermodal containers, barges, ships, and aircraft
- Facilitates application of water-proofing protection to the load; the overwrap applied accompanies the load for the entire journey
- Reduces incidence of lost or stray items
- Facilitates checking and inventory of shipment

PALLETIZING is the assembly of one or more packages on a pallet base and securing the load to the pallet.

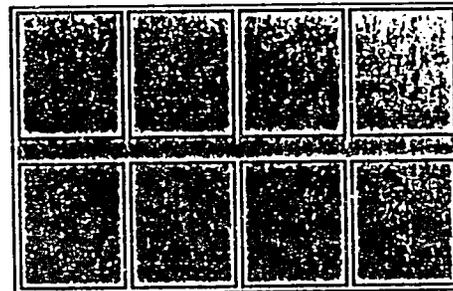
PALLETIZING CARGO

The optimal size of the pallet depends on the internal dimensions of the intermodal container and the form and weight of the packages. Four-way pallets (i.e., those that can be lifted from all sides by a forklift truck), usually make best use of the floor area of a container.

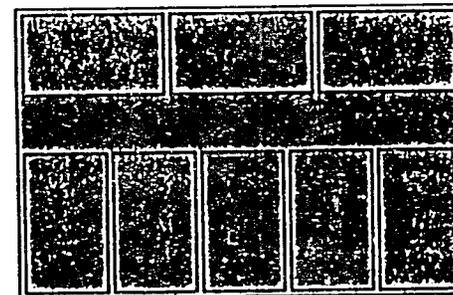
The recommended packing patterns for standard pallet sizes are shown in the following charts.

Select the pallet that:

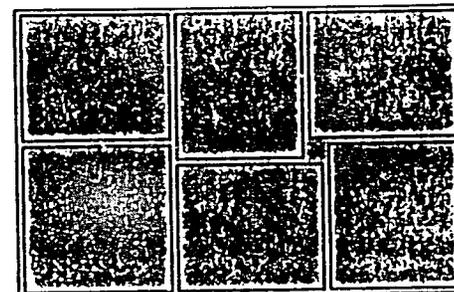
1. Best utilizes the space of the mode of transportation to be used.
2. Best utilizes the package dimensions of the item to be shipped.
3. Limits the weight of the palletized load to 2,200 pounds (1,000 kg).



Stowage pattern A for pallets.



Stowage pattern B for pallets.



Stowage pattern C for 4-way pallets only

Container Stowage

Pallet size mm inches	Recommended pattern	20'		40'		Floor utilization %
		Max. no.	Floor utilization %	Max. no.	Floor utilization %	
1,000 x 800 40" x 32"	A	14	85.2	28	81.2	
1,100 x 800 43" x 32"	A	14	91.4	28	89.5	
1,100 x 900 43" x 36"	A	12	88.1	26	93.5	
1,100 x 1,100 43" x 43"	A	10	99.7	20	87.7	
1,100 x 1,100 43" x 55"	A	8	91.5	16	89.5	
1,200 x 800 48" x 32"	BC	11	78.1	23	80.1	
1,200 x 1,000 48" x 40"	C	10	89.0	20	87.0	

This scene shows standard methods of transporting cargo across rivers in North

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Assemble the individual unit packages on the pallet base without an overhang. Vertically aligned packages provide maximum stacking strength; however, interlocking patterns afford maximum stability. The load pattern should minimize voids.

Insert spacers between the rows or layers of irregularly shaped items.

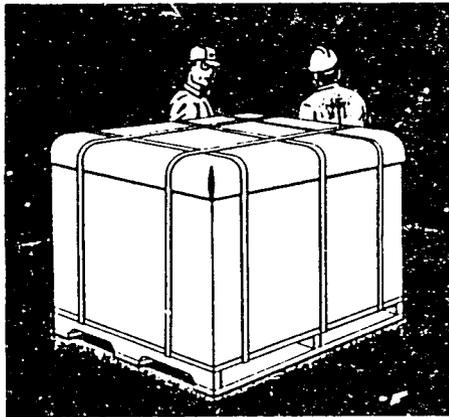
Adhesives can be used between cartons in a uniform load.

Secure the load tightly and firmly by using horizontal and vertical strapping.

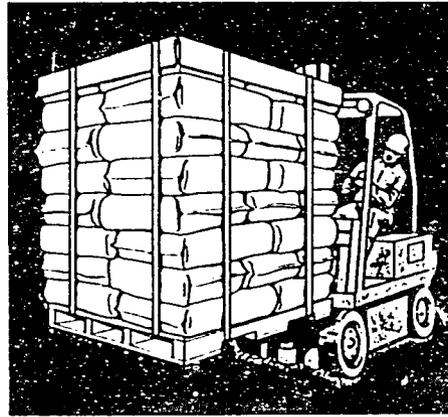
Plastic shrink wrap can be used to stabilize palletized loads and also affords some

protection against wetting. Another method used for protecting cargo susceptible to water damage is overwrapping with a barrier material.

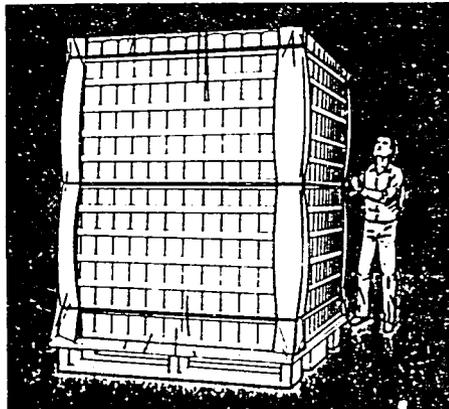
Provide stacking protection to the top of the pallet by using a lumber, plywood or fiberboard cap. Loads that are subject to compression damage must also be supported with vertical framing.



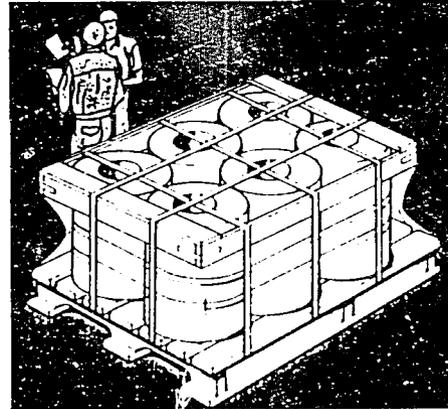
Palletized Consolidation Container



Palletized Load of Bagged Cargo



Shrink Film Overwrap of Palletized Load



Palletized Drum Load

UNITIZING CARGO

Unitizing is the assembly of one or more items into a compact load, secured together and provided with skids and cleats for ease of handling.

Assemble individual items into one unit by bolting, nailing or strapping together.

Provide vertical cleats on sides of load to facilitate handling by cargo slings.

Provide water damage protection by using plastic shrink wrap or stretch wrap on individual items before assembly into unit load.

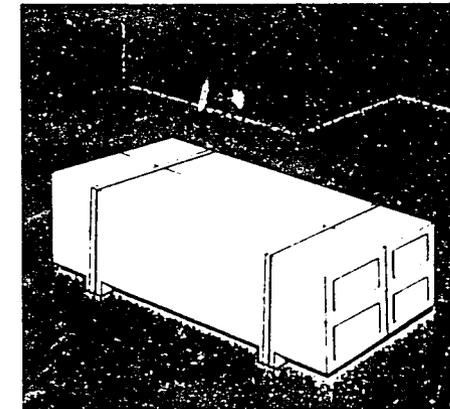
Apply shrink wrap or stretch wrap to entire load.

Use waterproof paper or plastic film overwrap.

The American National Standards Institute (ANSI) publishes a guide to aid manufacturers, consumers and the general public in selecting unit-load and transport-package sizes to efficiently fit within truck trailers, intermodal containers, or railroad box-cars. Unit load stacking patterns are also presented.

ANSI can be contacted at:

1430 Broadway
New York, NY 10018
Reference ANSI MH10



Unitized Load

SECURITY



Cargo security worldwide must be improved if theft and related losses are to be reduced. Losses range from the pilferage of individual items of cargo to the theft of a 40-foot container or the hijack of a tractor/trailer. Although the latter cannot be ignored, the majority of incidents involve cargo taken from transportation facilities by personnel authorized to be there and on vehicles controlled or similarly authorized by management. There is also a growing sense of the vulnerability of ship and ports/harbors to criminal and terrorist violence.

The task at hand is to establish and maintain a cargo security program, providing organizational, physical and procedural standards.

The Department of Transportation handbook entitled *Guidelines for the Physical Security of Cargo*, revised and updated by the National Cargo Security Council, is intended to assist responsible management within the entire transportation network. Clearly not regulatory in nature, the Guidelines, nonetheless, reflect latest state-of-the-art technologies and are strongly encouraged and suggested by prudence. An effective cargo security system can be modeled upon them. Copies of this publication are available through the Council's office.

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In some cases, attaining and implementing these recommended practices may entail substantial expense. However, they have proven to be effective. Conversely, "bargain basement" measures may provide a false sense of security and an open invitation to theft/pilferage. Experience demonstrates that the decrease in cargo loss, i.e., loss of profit dollars, far outweighs the expense of taking recommended security measures.

Several other organizations have pledged their support to making the ports of the world safe and secure. They are positioned to offer "local" solutions/approaches.

- The Port Security Committee of the American Association of Port Authorities is attempting to combat cargo theft by initiating discussions between transportation entities, insurance carriers, port management and law enforcement on the present state of affairs in cargo security. It has been concluded that cargo theft can be controlled effectively only when all concerned parties communicate with each other, and understand that cargo theft damages the profit potential, prestige and credibility of everyone within the industry.
- The International Association of Chiefs of Police is also strongly committed to the cargo crime battle. The Cargo Security committee of this association has provided training seminars and other aids to law enforcement and industry personnel involved in cargo security. They have assisted in the development of specialized training courses through the United States Federal Law Enforcement Training Center at Glyco, Georgia.
- On the global scene, the International Association of Airport and Seaport Police has addressed the problem by developing a truly international team of port law enforcement managers and directors capable of coordinating cargo theft investigations around the world. The IAASP is also committed to assisting the United Nations on the world's cargo secu-

expertise and other resources to help all nations deal with the problem.

Additional information relative to the aforementioned services and capabilities can be made by writing to the following addresses:

ATTN: National Cargo Security Council
1945 Old Gallows Road
Suite 580
Vienna, VA 22182

ATTN: Port Security Committee
American Association of
Port Authorities
1010 Duke Street
Alexandria, VA 22314

ATTN: Cargo Security Committee
International Association of
Chiefs of Police
1110 Glebe Road
Arlington, VA 22201

ATTN: General Secretariat
International Association of Airport
and Seaport Police
580-2755 Lougheed Highway
Port Coquitlam
British Columbia
Canada V3B5Y9

Although the pattern of maritime fraud, including insurance fraud, documentary fraud and charter party defaults, continues to decrease, significant opportunities still exist due to prevailing economic and political conditions. "Fraudsters" continue to exploit embargoes and countries where increasing trade activity is not matched with improvements in local infrastructures.

The International Chamber of Commerce's International Maritime Bureau (IMB) continues to work toward the prevention and control of fraud and related suspect practices. They can be reached at

Maritime House
1 Linton Road
Barking, Essex IG11 8HG
United Kingdom
+4-81-591-3000 (Phone)
+4-81-594-2833 (FAX)
Telex: 8956492 IMB LDNG

Note: Systems that integrate a powerful x-ray source with a vapor detection device now enable Customs or relevant port authority personnel to quickly examine cargo without the need to unload and unpack conveyance, container or pallet. Shippers should be advised that the high energy x-ray capable of penetrating fully loaded ISO containers can adversely affect goods, inter alia, live tissue, unexposed photographic material, certain raw materials for the manufacture of film and some pharmaceuticals. In these instances, manifests should be declared as to contents and bills of lading claused "DO NOT X-RAY." Having the local representative or consignee attend during clearance operations is a further positive step.

Suggestions for Valuable Shipments (Air)

In planning the shipment of valuable cargo, seek a level of security comparable to the security you know you require for your own premises.

Select a tariff designed for the movement of valuable goods and abide by its recommendations.

Make advance booking with a carrier for shipment so consignees may be on alert for arrival.

Tender shipment to carrier not more than 3 hours prior to the scheduled departure of the flight for which advance arrangements have been made.

Notify the consignee to accept delivery of the shipment at destination within 3 hours after scheduled arrival time of flight.

Avoid shipping when consignment will arrive at destination on weekends or holidays.

When delays in acceptance of valuable merchandise are anticipated e.g., when weekend or holiday arrivals are unavoidable, arrange for special handling such as transportation via an armored vehicle or placement in a suitable repository.

Adhere to minimum package dimensions. Most tariffs provide for minimum package size of one cubic foot.

Use only new, well-constructed packaging for your product.

Clear and complete delivery and handling instructions should appear on at least three surfaces of the exterior shipping package.

Eliminate all product identification on the exterior of shipping package.

Avoid shipping on a routine schedule and report suspected theft quickly.

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MARKS AND SYMBOLS

MARKS

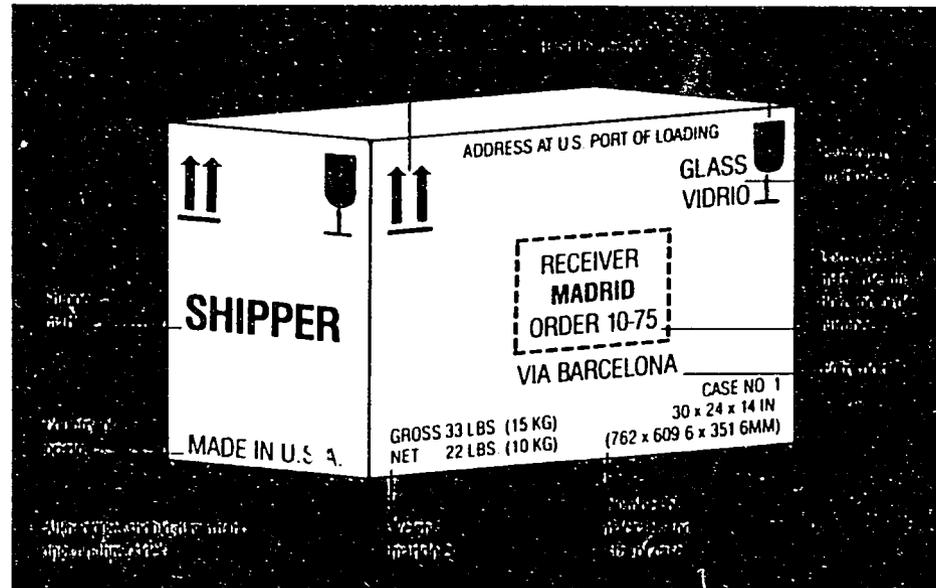
The primary purpose of marking is the identification of the shipment, enabling the carrier to forward it to the ultimate consignee. Old marks, advertising and other extraneous information only serve to confuse this primary function for cargo handlers and carriers. Follow these fundamental marking rules:

1. Unless local regulations prohibit, use coded marks; particularly where goods are susceptible to pilferage. Change them periodically to avoid familiarity by cargo handlers. Trade names should be avoided as they may indicate the nature of the contents.

2. Consignee (identification) marks and port marks showing destination and transfer points should be large, clear and applied by stencil with waterproof ink. They should be applied on three faces of the package, preferably side, and/or ends and top.

3. If commodities require special handling or stowage, the shipping package should be so marked, and this information should also appear on the bill of lading.

4. Cautionary and handling markings must be permanent and easy to read (use the languages of both the origin and destination countries). The use of stencils is recommended for legibility — do not use crayon, tags, or cards. An example of marking on an export pack is illustrated.



This unique maritime alphabet, used throughout Ports of the World as illuminations, was created especially for the 1-4th edition by photographer Peter Olson. Mr. Olson is a Philadelphia-based photographer who developed this alphabet while on the docks researching subjects for Ports of the World.

NON-HAZARDOUS PICTORIAL MARKINGS

It is recommended that handling instructions be printed on the exterior pack in the language of the destination country. It is not unusual for a shipment to be handled by another country along the transport path or by cargo handlers that cannot read. These potential problems can best be overcome by pictorial markings. The international symbols depicted represent markings that have been accepted as standards.



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HAZARDOUS MATERIALS

Unilateral state regulation of international commerce is impractical in today's interdependent world. Procedures that are acceptable in one country and forsaken in another inhibit world trade through embargo or unacceptable delay in cargo reaching its ultimate destination. The labels shown on these pages are the hazardous material (dangerous goods) identification adopted by all IMO and ICAO member countries to smooth the flow of these type materials in waterborne and air commerce. The color coding, symbol and class number (when displayed) are universal.

These labels provide an important identification of packaged dangerous goods in transport. They will alert cargo handlers to special stowage and segregation needs along the transport path. Dangerous goods regulations almost always require special documentation and packing under strict criteria. These shipments should be booked in advance with the carrier so that applicable restrictions can be determined prior to actual shipment.

IMPORTANT—Do not assume that compliance with domestic regulations will automatically qualify a shipment for passage through enroute countries and the destination port. Requirements that are not met can easily be the difference between profit and loss.

If the material may be hazardous, then, in addition to all known required markings and labels, furnish pertinent chemical or physical data.

All international air and ocean shipments must meet UN performance packaging standards, effective January 1991. There are, however, some exceptions such as limited quantity shipments.

Shippers will be permitted to continue to use the Code of Federal Regulations (CFR), Title 49 for all domestic shipments. However, the new ICAO Regulations are MANDATORY for all international ship-

Hazard Classes

1. Explosive—(Class 1.1, 1.2, 1.3, 1.4, 1.5 and 1.6). Articles bearing Explosives labels shown and falling in Divisions 1.1, 1.2, 1.3 (with a few exceptions), 1.4F and 1.5 are normally forbidden for air transport.

2. Gases—(non-flammable, flammable* and toxic)

3. Flammable Liquids.

4. Flammable Solids, Spontaneously Combustible Substances and Water Reactive ("Dangerous when wet") Substances.

5. Oxidizing Materials—(oxidizing matter and/or organic peroxides).

6. Poisonous Substances (liquids and solids) **and Infectious Substances.**

7. Radioactive Materials—(White I, Yellow II or Yellow III).

8. Corrosive Materials—(acids, corrosive liquids/solids and alkalines).

9. Miscellaneous Hazardous Materials—(those materials and articles that may present limited hazards for transportation but do not meet criteria for Class 1 through 8)

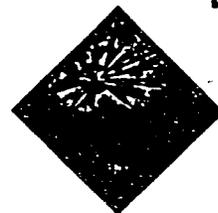
**Inflammable as used in the IMO hazard labels has the same meaning as flammable. IMO uses Non-Flammable Compressed Gas wording.*

Note

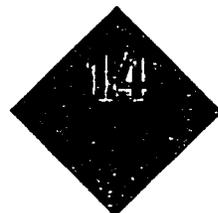
(A) Except for Radioactive and 1 handling labels, text indicating the nature of risk on the label is optional.

(B) When secondary or tertiary hazards are present, the appropriate label must be used. The omission of the hazard class or division number indicates the risk is subsidiary.

BEST AVAILABLE DOCUMENT



Class 1
Explosives



Class 3
Explosives



Class 1
Explosives



Class 2.1
Flammable Gases



Class 2.2
Non-Flammable Gases



Class 3
Flammable Liquid



Classes 4.1
Flammable Solid



Class 4.2
Spontaneously Combustible
Substances



Class 4.3
Water Reactive
Substances



Class 5.1
Oxidizing Agent





Class 6.1
Poisons (Toxicity
Groups I and II)



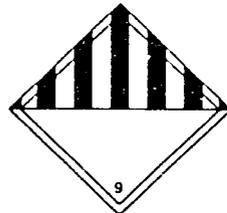
Class 8
Corrosive Materials



Handling Label (For Air Shipments Only)



Class 6.1
Poisonous Substances
(Toxicity Group III only)



Class 9
Miscellaneous
Hazardous Materials



Handling Label (For Air Shipments Only)

Cautionary Markings (see illustration on page 91)



Class 6.2
Infectious Substance



Class 7
Radioactive Materials
(White I)



Class 7
Radioactive Materials
(Yellow II)



Class 7
Radioactive Materials
(Yellow III)

English	French	German	Italian	Spanish	Portuguese	Swedish	Japanese	Chinese	Arabic
Handle with Care	Attention	Vorsicht	Maneggiare con Cura	Manejar con Cuidado	Tratar Com Cuidado	Versant	取扱注意	注意	استعمال بحرص
Glass	Verre	Glas	Vetro	Vidrio	Vidro	Glas	ガラス	玻璃	رطاح
Use No Hooks	Manier Sans Crochets	Ohne Haken handhaben	Non Usare Ganci	No Se Usen Ganchos	Nao Empregue Grachos	Bepagna inga kroka	フックは使用しない	フックは使用しない	عدم استعمال الحبال
This Side Up	Cette Face En Haut	Diese Seite oben	Atto	Este Lado Arriba	Este Lado Para Encima	Denna sida upp	この面を上向き	この面を上向き	هذه الوجه موعى
Fragile	Fragile	Zerbrechlich	Fragile	Fragil	Fragil	Ömtaligt	fragile	fragile	فاتم الكسر
Keep In Cool Place	Garder En Lieu Frais	Kuehl auf bewahren	Conservare in luogo fresco	Mantengase En Lugar Fresco	Deve Ser Guardado Em Lugar Fresco	Förvaras kallt	冷所保管	冷所保管	احفظ في مكان بارده
Keep Dry	Protger Contre Humidite	Vor Nässe schuetzen	Preservare dall umidita	Mantengase Seco	Nao Deve Ser Molhado	Förvaras torrt	乾燥を	乾燥を	احفظ في مكان جاف
Open Here	Ouvrir Ici	Hier öffnen	Aprire	Abrese Aqui	Abra Aqui	Öppna här	ここを開く	ここを開く	افتح هنا

BEST AVAILABLE DOCUMENT

TABLES AND GUIDES

Export Guide

Cargo moves on paper! The part you play is shown in the following steps.

Shipper

1. Prepares Domestic Bill of Lading for movement of cargo to pier, and sends copy to his forwarder along with packing list.
2. Marks cargo plainly to show
 - special shipping and handling instructions
 - gross and net weights
 - destination
 - country of origin
3. Checks Ocean/Air Bill of Lading:
 - number of packages/weight
 - marks and numbers
 - description of cargo
 - destination
 - gross weights of each package shipped
 - consignee

Inland Carrier

4. Accepts cargo for transit to the port/airport.
5. Secures container interchange agreement.
6. Advises freight forwarder or shipper's local representative of cargo arrival.
7. Obtains Receipt from forwarder or other representative to accompany cargo
8. Contacts terminal operator to make appointment for special handling or equipment, if required.

Forwarder

9. Provides Dock Receipt and special permits, if any, to delivering inland carrier.
10. Checks Dock Receipt for completeness:
 - name of shipper
 - name of vessel/airline
 - ports of loading and discharge
 - description of cargo
 - shipper's export declaration number, if required

Terminal Operator

11. Issues pass to driver at gate house.
12. Assigns driver a checker and an unloading spot.
13. Retains original of dock receipt and forwards a copy to the Ocean Carrier/Airline.

Airline/Ocean Carrier

14. Issues Bill of Lading to shipper or shipper's agent.

Import Guide

Ocean Carrier/Airline

1. Notifies consignee on arrival of shipment
2. Provides freight release to terminal operator.
3. Obtains customs release, freight release, clearances and other required documents before contacting inland carrier.
4. Forwards to inland carrier an original of the Domestic Bill of Lading and an original Delivery Order, which authorizes pickup of cargo.

Customs Broker

5. Checks Bill of Lading for completeness.
6. Checks Delivery Order for completeness:
 - forwarder's name
 - shipper's name
 - ultimate consignee's name
 - inland carrier making pickup
 - vessel/airline
 - arrival date
 - voyage/flight number
 - ocean/air bill of lading number
 - pier/air cargo terminal number and location
 - marks and numbers
 - number of packages
 - description of goods
 - gross weights
 - legible signatures
7. Guarantees with terminal operator loading charges and demurrage.

Terminal Operator

8. Issues pass to driver at gatehouse.
9. Checks Delivery Order for completeness and legibility.
10. Assigns checker and loading spot.
11. Loads cargo. Checker notes exceptions and shortages.

Inland Carrier

12. Secures container interchange agreement.
13. Ascertains expiration of free time and availability of cargo for pickup.
14. Provides driver with original and copy of Delivery Order.
15. Contacts terminal operator to make appointment, if required.
16. Dispatches trucker to the terminal.
17. Signs tally and loading ticket. Exceptions and shortages noted
18. Advises broker of completion of cargo pickup.

Consignee

19. Upon receipt of shipment, checks quantity and condition against documentation
20. If loss or damage is discovered, makes appropriate notation on delivery receipt. Follows recommendations contained in the "How to File a Cargo Claim" section

BEST AVAILABLE DOCUMENT

Export Documents

1. Bill of Lading

A receipt for the cargo and a contract for transportation between a shipper and the carrier. It may also be used as an instrument of ownership.

2. Dock Receipt

Used to transfer accountability for the cargo between domestic and international carriers at the terminal.

3. Delivery Instructions

Provides specific information to the inland carrier concerning the arrangement made by the forwarder to deliver the cargo.

4. Export Declaration

Required by the U.S. Department of Commerce to control exports and acts as a source document for export statistics.

5. Letter of Credit

A financial document issued by a bank at the request of the consignee guaranteeing payment to the shipper for cargo if certain terms and conditions are fulfilled.

6. Commercial Invoice

A bill for the goods from the seller to the buyer. It is often used by governments to determine the true value of goods for the assessment of customs duties.

7. Certificate of Origin

A document that is used to assure for the buying country precisely in which country the goods were produced.

8. Insurance Certificate

Assures the consignee that insurance is provided to cover loss or damage to the cargo while in transit.

9. Transmittal Letter

A list of the particulars of the shipment and a record of the documents being transmitted together with instructions for disposition of documents.

Import Documents

1. Arrival Notice

Sent by the carrier, it informs the "notify party" of the estimated arrival date of the shipment.

2. Customs Entry

Required by U.S. Customs for entering goods into the United States. The form contains information as to the origin of the cargo, a description of the merchandise and estimated duties applicable to the particular commodity. Estimated duties must be paid when the entry is filed. Associated documents include:

- Entry Summary (for certain "trade sensitive" imports).
- Delivery Authorized Document (DAD) — A form prepared by the Customs broker, and lodged with the carrier as evidence of Customs release.
- Immediate Transportation (IT) Entry — Allows the cargo to be moved to an inland destination via a bonded carrier.
- Transportation and Exportation Entry — Allows goods to enter the U.S. for the purpose of transshipment to a third country.

3. Carriers Certificate and Release Order

Used to advise Customs of the details of the shipment, its ownership and port of loading.

4. Delivery Order

Issued by the consignee or consignee's Customs broker to the carrier as authority to release the cargo to the inland carrier.

5. Freight Release

Evidence that the freight charges for the cargo have been paid.

Foreign Trade Contracts

As we have tried to demonstrate, shipping goods internationally can be risky. Aside from physical loss or damage, cargo delivery may not take place due to other reasons, and erodes the climate of confidence between the buyer and seller. However, if when drawing up their contracts, the parties can agree on terms of sale, they have gone a long way toward delineating respective responsibilities and precluding misunderstandings and subsequent formal disputes.

The International Chamber of Commerce publishes their *Incoterms* to provide a set of international rules for the interpretation of the terms commonly used in foreign trade transactions for those who prefer the certainty of uniformity over the varied interpretations of different countries and jurisdictions. Another source is the National Foreign Trade Council's *Revised American Trade Definitions*.

Typical Transactions

Terms of Sale	International Code	Risk Transfer Point (Seller to Buyer)
Ex Works (Factory/Warehouse/etc.)	EXW	Seller's Factory, Warehouse, etc.
Free Carrier (named point)	FCA	Depot, Country of Origin
Free Alongside Ship	FAS	Upon Effective Delivery Alongside Vessel
Free On Board (named port of shipment)	FOB	On Board Vessel, Port of Shipment
Cost and Freight (C&F)	CFR	On Board Vessel, Port of Shipment
Cost, Insurance and Freight	CIF	On Board Vessel, Port of Shipment
Delivered at Frontier	DAF	At named point at frontier but before Customs border of adjoining country
Delivered Ex Quay (Duty Paid)	DEQ	On Quay/Warf, Port of Destination
Delivered Ex Ship	DES	On Board Vessel, Port of Destination

BEST AVAILABLE DOCUMENT

CLIMATIC MAP OF THE WORLD



1 Winter Gales
December-February

2 Hurricanes
July-September

3 Hurricanes
June-September

4 Monsoons
a June-July
b August-October

5 Winter Gales
May-July

6 Winter Gales
November-March

7 Typhoons
June-October

8 Monsoons
a June-August
b December-February
c October-February

9 Willy-Willies
December-March

BEST AVAILABLE DOCUMENT

Determination of Wind Speed by Sea Condition

Knots	Description	Sea Conditions	Wind Force (Beaufort)	Probable Wave Height (in ft.)
0-1	Calm	Sea smooth and mirror like	0	0
1-3	Light air	Scale like ripples without foam crest	1	1
4-6	Light breeze	Small short wavelets crests have a glassy appearance and do not break	2	1.2
7-10	Light breeze	Large wavelets some crests begin to break foam of glassy appearance Occasional white foam crests	3	2
11-16	Moderate breeze	Small waves, becoming longer fairly frequent white foam crests	4	4
17-21	Fresh breeze	Moderate waves taking a more pronounced long form many white foam crests there may be some spray	5	6
22-27	Strong breeze	Large waves begin to form white foam crests are more extensive everywhere there may be some spray	6	10
28-33	Near gale	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind squall begins	7	14
34-40	Gale	Moderately high waves of greater length edges of crests break into squall foam is blown in well-marked streaks along the direction of the wind	8	18
41-47	Strong gale	High waves dense streaks of foam along the direction of the wind crests of waves begin to topple tumble and roll over spray may reduce visibility	9	23
48-55	Storm	Very high waves with long overhanging crests The resulting foam in great patches is blown in dense white streaks along the direction of the wind On the whole, the surface of the sea is white in appearance The tumbling of the sea becomes heavy and shocklike Visibility is reduced	10	29
56-63	Violent storm	Exceptionally high waves that may obscure small and medium sized ships The sea is completely covered with long white patches of foam lying along the direction of the wind Everywhere the edges of the wave crests are blown into froth Visibility reduced	11	37
64-71	Hurricane	The air is filled with foam and spray Sea completely white with driving spray, visibility very much reduced	12	45

(Courtesy U.S. Weather Bureau)

BEST AVAILABLE DOCUMENT

The CIGNA Companies gratefully acknowledge the information received from the following organizations:

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 International Cargo Handling Coordination Assoc.—ICHCA
 International Civil Aviation Organization—ICAO
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Presentation Details:

Definition:

Packaging may be defined as a unifying system for applying the fragmentary operations of many other disciplines such as Mechanical Engineering, Food Technology, Industrial Engineering, and Chemical Engineering to the total problem of delivering goods from the source to the point of use with maximum efficiency.

Packaging is not merely a means of containing products, but rather in it's broader sense, it involves all aspects of handling, storage, preservation, distribution, advertising, sales, promotion, display, dispensing, preparation and various other facets of the Industrial System from which the product is born. It is art and science; materials and equipment; it is protection, promotion, law, logistics, manufacturing, and materials handling all rolled into one.

The design of the package is also not an isolated thing, but part of a larger effort to carry products to their end use successfully. As such, the package must fit into the manufacturing-marketing system and contribute it's share to the effective operation of all the segments of the whole process. Therefore, the design of the package must be measured against the capabilities of engineering, advertising, distribution and the final application conditions for which it is intended.

There are three broad categories of Packaging that require very different technologies and talents for their accomplishment:

- (1) consumer packaging,
- (2) industrial packaging, and
- (3) military packaging.

Consumer (retail) = importance of visual appearance is emphasized

Industrial = protection, cost, convenience, and appearance emphasized in about that order.

Military = Protection emphasized

My discussions will focus on consumer packaging, including food pharmaceutical, soft goods, hardware and cosmetics, toiletries, and more. I will spend proportionately more time however, addressing food packaging concerns.

Functions of Packaging

Protect (most important)

Shock & Vibration, Water, Moisture, Oxygen, Odors, Flavors, Contamination, Tampering, U.V. Light, pressure, temperature, Etc.

Communication

Identify product, Display , sell, instruct, inform, etc.

Facilitate

(free from difficulties - obstacles to use - make easier to use)

Use, Reuse, dispense, convenience, disposal, handling (unitized)

Packaging Definition Continued

A device to contain and/or protect and/or convey (as in transport and as in conveying a message)

Primary Package

In direct contact with the product

Secondary Package

Enclosing the primary package

Problem Solving

Know Your Product: Get all available information.

Analyze the Market: Get a clear understanding of the segment of the Market for which the Package is expected to serve. It is necessary before a good design can be created. Whether the potential customer is a male or a female, young or old, rich or poor, urban or rural will often affect the type of design to be recommended.

Competitive Packaging: The appearance of a Package may look far different on the drawing board or on a round table for discussion than it does sitting on the shelf. It is wise to view a new package on the shelf beside others. It is often times recommended to your product stand-out on the shelf by being taller or having a contrasting color.

Recognize needs: A well designed package will cater to the needs of the purchaser. These may be psychological or practical needs. The package design must show at once the intended use, method of dispensing or application, and promised results or satisfaction of needs.

EX: Talcum Powder in a scouring powder container
Face Cream in Shoe Polish container
Fancake mix in Laundry Soap box

All five senses should be considered when designing the Package and not merely the visual impact.

Innovations: In some cases the Package becomes part of product. Containers and closures that measure, mix, or dispense the product can be considered an integral part of the product concept. Ex: Popcorn in a disposable cooking utensil. A radical design concept carries risk, but often is more likely to bring an outstanding success over mediocre success.

Small or Large Volume: The requirements of the package design depend largely on the quantities involved.

The small volume item, will not justify special molds and sophisticated equipment, but utilize stock containers where available, and semi-automatic or manual assembly operations. This type of assignment is not easier; on the contrary, the limitations of the small volume tax the knowledge and skill of the developer.

Export Problems: The hazards of transportation sharply increase. Handling of goods off and on ships can put considerable strain on the package. Slings and considerable hand labor increase the hazard. Consider unitized packaging. Often a rule of thumb is to increase the Package strength by 150%. (See section on Export)

Note on Vending Machines: Rigid package much more easily dispensed than flexible pouch or bag. Very thin items are difficult to dispense. Oversized is a problem.

Functions of Packaging

Notes used in Presentation:

Historical Perspective Summary:

- Contain
- Carry
- Dispense

As time went on, other requirements were added such as:

- preserve
- measure
- communicate
- display

Today we want to add:

- motivate
- promote
- glamorize
- build-up.

Elements of Packaging

Structure
Style
Aesthetics
Communication
Legal

Structure: contains or limits it's contents; Crates, nets, cocoons, displays etc. It's the shape of the package. It may be dictated by availability of containers and needs of the product, the maximum size along with stability, space limitations on the shelf and at home.

Aesthetics & style: This represents the part appearance plays in the effectiveness of the package. One large area of study on the Psychology of colors, copy, communication etc. is part of this discipline.

Communication: The least amount of copy is usually most effective.

Enough information is required to answer the buyers questions.

Legal: Product Liability is considered when a poor package can cause damage or injury to people resulting in costly litigation and unfavorable publicity. Designing hand holes in heavy boxes, including warning labels where necessary, Must follow GMPs and industry standards. Current liberal laws allow suit throughout entire distribution chain.

Technology Introduction

Processes & Materials

Materials:

Paper and paperboard are still generally the most economical and continue to make up the majority of packaging.

Metals high strength, rigidity, and comparatively, in flexible packaging only foil or foil laminates provide equal barrier protection. Glass bottles and jars are chosen over plastic for being inert and are used for precious commodities

Most exciting area is the work going on in plastics.

Processes:

Must know the possibilities and limitations of machinery.

Cost considerations important element.

Testing of materials: ASTM handbook

Specification development.

Materials Presentation Details

Plastics in Packaging

Notes:

Two kinds of Plastic:

Thermosets- once heated they are permanently set. Cannot be reformed.

Thermoplastics- can be repeatedly reheated and reformed.

Sources of Plastic:

All carbon based elements. crude oil, natural gas, & organic chemicals.

Monomers are chemical compounds that can be combined in chains to form polymers, which are what is necessary to make plastic.

Ethylene is a combination of Hydrogen & Carbon

First plastics:

1843-Gutta Percha found in Malaysia. A rubber-like sap from trees.

1845-Cellulose Nitrate=cellophane paper based plastic-like.

1933-Polyethylene

Advantages of plastics over other packaging media:

*lightweight

*high strength to weight ratio.

*most have excellent resistance to products

*ability to be tailored to the needs of the product.

*shape very well and are easily modified.

*can be soft or rigid

*thin or thick

*containers can be made right in line along with product

Sheets vs. Films

Big difference is flexibility

Films less than 10 mils in thickness

Sheets are over 10 mils

Kinds of Plastic

Over 7000 different combinations of plastic films available.

Most used plastic in Packaging is Polyethylene (PE)

and most PE used in Packaging is low density PE (LDPE)

LDPE characteristics include:

*translucent, milky look

*very limp

*good flexibility

*good moisture barrier

*high puncture and tear resistance

*poor machinability, but low melting temperature 180F"

*high gas permeability (not a good barrier for CO2 or oxygen)*LOWEST COST FILM sometimes used in stretch wrapping

Linear low density PE (LLDPE)

*stiffer, stronger, more expensive than LDPE

High Density Polyethelene (HDPE) characteristics include:

*less clarity then LDPE

*packaging applications are primarily blow molding

*more expensive than LDPE

Polypropylene:

PP is extensively used in Packaging.

*excellent clarity

*stiff film with excellent machinability

*higher sealing temperatures 280F"

*good gas barrier properties

*moisture barrier good, not as good as LDPE

*high resistance to tear initiation-but low tear resistance.

*usually needs coating, lamination, or coextruded skins to aid in sealing

Polyester: (PET)

Growing share of packaging markets

*high temperature resistance: used in ovenable trays

*high tensile strength

*Used frequently in carbonated beverage bottles.

*fair oxygen barrier

*Stiff with good machinability characteristics

*high sealing temperatures required

*MOST EXPENSIVE SINGLE LAYER STRUCTURE IN THE FILM FAMILY

Polyvinylchloride (PVC)

Popular packaging film

*more expensive than PE but less expensive than PP

*great clarity

*very tough, high puncture and tear resistance

*very limp, similar to LDPE

*clings and is difficult to machine; often laminated to other films to enhance machinability.

*can be blow molded into bottles

*used to package oils and alcohol solvents.

*used for shampoos, cooking oils, & household chemicals.

*USED IN STRETCH WRAPPING

Expanded Polystyrene (EPS)

foamed polystyrene used for cushioning materials

*uses include egg cartons, cups packing peanuts, EPS is formed in molds to the shape of the product.

Polystyrene (PS)

blow molded very clear bottles, vitamins, spices, & medicine.

Plastic Packaging Forming Processes:

- *injection molding-hot resin forced in die and cooled. (caps)
- *blow molding-hot resin blown into mold
- *Thermoforming-films heated until soft and drawn into mold by a vacuum. sometimes referred to as vacuum molding
- *Blister packs-similar to thermoforming but form is sealed to plastic coated paperboard.

Making Plastic Films

- *Bubble process- film blown into a large bubble, stretched, slit up both sides and wound on rollers.
- *Cast film processes - film is cast in a mold
- *Extrusion/tenter frame process. Film is extruded stretched in the machine direction (MD) by progressively speeding up rollers and then stretched in horizontal or transverse direction. (TD) by tenter frame clips.

Film variations:

- *Coated films: coatings are "painted" on the film to enhance properties often including sealing characteristics or barrier properties. Example of coatings: Acrylic, Latex, Saran (PVDC),
- *Laminated films: two or more films are "glued" together to create composite structures necessary for given product protection requirements.
- *Co-extruded Films: usually three resins are extruded simultaneously in layers with a base film and two "skins", one on each side. Current technology allows for up to nine layers to be simultaneously extruded. Composite structures allow for creating customized structures with any combination of properties.

Converting film:

Converters as defined here are those businesses that buy raw film and add value before selling to an end user who may in turn use it on form fill and seal machines, or simply on overwrappers.

Converting includes: Printing, slitting, coating, laminating but not co-extruding. It might include bag and pouch making.

Problems with film:

- Blocking-films sticks to itself on roll, caused by winding too tight or exposure to too much heat in warehouse;
- Static: causes clinging to machine, use static eliminators
- Sweating: film must be brought to room temperature before running on equipment.
- Odor: cause from improper curing or drying of inks & laquers
- Gauge bands: caused by thickness variations across web or improper winding.
- COF variability: too sticky....too slippery process control problem by vendor.
- Color variation: print problem, foreign matl, old film.

Terms to Know:

Yield, COF, Tensile strength, Lap seal, Fin Seal, MD, TD,
Modulus of elasticity, Hot Tack, Seal strength, gloss
film memory,

Examples of Packaging machinery using film:

Doboy, Sitma, Hart, Scandia, Hayssen, GD, FA, FMC and more

General info:

Seals require time ,temperature and pressure control.
Plastic packaging reduces solid waste by using less volume
than paper, steel or glass. It is all recyclable but rarely
is because cost to recycle is more than virgin resin. Less
product wast because it extends shelf-life of
products(foods)

Can be burned-recapture energy, or buried safely
(almost inert)

Materials Presentation Details

Adhesives

Total adhesive production in the US is over one billion lbs. annually.

Packaging uses about 25% at a cost of about 900MM

Greatest single use of adhesives is in the manufacture of plywood.

First adhesives:

Pitch from trees, egg whites and human saliva

Animal glue used over 3000 years ago by Egyptians.
Animal glue is made from bones at meat packing plants.
The bones are dried, ground and refined into a crystalline structure, reconstituted with water to make them into glue.
Hence; the term glue factory

Casein made from cows milk. use dates back to prehistoric times.

Glue has been made since the 9th century from fish, stag horns, and cheese.

The "natural" adhesives are made of starch based products such as vegetable proteins.

They can be made from any starch based material. In the US mostly made from corn. In other countries, wheat or potatoes are used.

They are readily available and they are cheap. least expensive adhesive available.

They have good heat resistance.

Properties are consistent and work exceptionally well on paper. They are used in corrugated board manufacturing, tube lining, paper laminating, labels, case sealing, carton sealing bag making and others.

The viscosity of starch based adhesives range from fluid to gummy.

Color varies from white to amber.

work at temps around 140F

Some of the disadvantages of natural adhesives are that they have low water resistance, slow setting times,

The "synthetic" adhesives are resin emulsion, latex, hot melt or solvent borne.

The most used synthetic is resin emulsion

They cost 2 to 3 times more than natural adhesives.

It is preferred by many packagers for sealing purposes.

It tends to be non-crystalline and of high molecular weight.

It is usually a derivative of PE or PVA

It often appears as a liquid white glue.

Has little odor, toxicity, color variation, and imparts no taste characteristics.

Latex adhesives are used and are five times more expensive than starch based adhesives. It is use for self sealing bags, envelopes, and wrappers and foil/paper laminations.

Hot melts are the most expensive adhesive costing 6 to 8 times the cost of starch based adhesives. It is an all solid adhesive and is a blend of plasticizer, polymer resins, and waxes.

Requires temps between 250 and 400 F to melt Usually purchased in the form of pellets, granules, chips, or bricks.

colors vary from white to brown, but can be customized to any color.

They are fast setting and work very well on high speed applications.

Solvent borne adhesives are a broad based adhesives made up of polymers and modifiers dissolved in organic solvents. Fast drying with colors ranging from white to brown. Most are flammable.

Commonly used in graphic arts and film to film laminations, paper/foil laminations, and other flexible packaging structures. They are also used for pressure sensitive labels and tapes. Application must be in vented areas because of toxicity to workers.

There is a 50/50 use split in Packaging between natural and synthetic adhesives.

Metals in Packaging

* Metals used in Packaging date back farther than recorded history.

Metals such as gold and silver that were malleable could be beaten into shapes and used as containers. Samples of lead foils dating to 5000 BC have been found. As late as 1926 lead foils were still be used to line tea boxes for ocean shipping. In the 1930s lead foil was still being used to line cigarette packages

The use of metal cans was encouraged by Napoleon in about 1809. He was having problems feeding his army who were forced to consume spoiled and inadequate rations during their long military campaigns. His Navy developed scurvy from lack of proper nutrition. He offered the sum of 12,000 French Francs, which was a virtual fortune in it's time, to anyone who could develop a package to keep food consumable over long periods of time and that could be shipped over great distances. That same year a frenchman, Nicholas Alpert found that food sufficiently heated in a sealed container would work. He used glass however which was not suitable for the Army. The next year an Englishman, Peter Durant invented the tin canister. A three piece can soldered at the seams. The can when packed and heated met the needs of Napoleon and was considered a great breakthrough. It was not until 50 years later that "PASTUER" explained why what these gentleman were doing worked.

Today 27% of all packaging done world-wide is done in Metal cans. Packages made of metal consumes 7% of the total world production of steel and 21% of aluminum production. Worldwide, beer and soft-drinks account for more than 57% of the cans used in Packaging. In the U.S. more cans are made of aluminum than steel. More than 400 million metal drums are used annually for oils, paints, chemicals and inks. Over 250 million steel pails are purchased annually.

When cans were made by hand they were made slowly. At best, a worker could produce 300 cans a day. Today there are machines capable of producing 600 cans per minute. More commonly however, machines can make 250 per minute.

The common three piece can starts with a steel flat blank that is cut and notched, rolled and hooked, and then the side seam after being hooked is welded. (In some cases it is cemented or glued.) The bottom is fanged and a lid is rolled around the bottom and welded to complete the seal. After filling the top is rolled on with a double seam.

Tin coatings were used in the past, but today the metal cans are coated with chromatic films or aluminum enamel and vinyls. The cost of mass manufacturing a can is approximately \$.08/each.

Two piece cans are growing but are more expensive. The 2-piece can eliminates the side seam. The manufacturing process is called "draw and redraw". (Discussion)

"Necking Down" is a trend to reduce cost of can ends (Discussion)

Fillers are designed to fill and seal cans at rates of up to 2000 cans/minute.

Display is limited only by the imagination used in label design.

Round cans leave allot of airspace between containers for shipping.

Recycling aluminum high...steel low.

Metalizing films.....Discussion....samples.

Paper

Paper is defined as the name of all kinds of matted or felted sheets of fiber (usually vegetable but sometimes mineral, animal or synthetic) formed on a fine wire screen from a water suspension. Paper derives its name from the term papyrus, a sheet made by pasting together thin layers of an Egyptian reed used in ancient times for writing paper.

Paper is one of two broad subdivisions of paper, the other being paper board. The main difference is thickness. Paper is any sheet less than 12 points in thickness. Paperboard is material that is 12 to 70 points in thickness. (1 point = .001 inches)

History of Paper:

China

8th century = Muslims of Baghdad

Spain

Italy

France

England

1830 Rags to wood fiber

1800s Fourdriner machine

Worldwide-paper is used at a rate of 50 pounds per year per person. In the US that number is 10-fold.

55,000 gallons of water are required to make one ton of paper. The water is usually recycled and kept in a continuous process without being dumped into the environment. In addition to 2 cords of wood pulp, the process uses sulphur, magnesium hydroxide, lime, salt cake, alkali, starch for binding, alum for improved properties in paper, clay for smooth surfaces, rosin, drying pigments and allot of energy in the form of coal and/or electricity.

There are basically two types of paper made.

Fine..for writing printing and some wrapping

Coarse..most used in packaging or protective devices.

Paper for the most part is made from wood. Wood is made up of
50% cellulose

30% lignin (glue-like substance that must be removed) If left in paper at too high a proportion the paper will turn yellow when exposed to UV light.

20% is a mixture of carbohydrates, proteins resins and fats and provide no benefit to paper.

Softwood fibers provide the best packaging papers. The fibers are longer and stronger than hardwood. Hardwood has shorter fibers but imparts more stiffness characteristics. Generally more use in fine papers.

Modern Paper making machines are huge. A fourdrinier machine is as long as a city block and three stories high. Paper is produced up to 30 feet wide and usually operates around the clock at speeds of about 3000 ft/minute, or 800 miles of paper a day.

The second most popular papermaking machine is the cylinder machine. It is used to make heavy grades of "paperboard" since it is much thicker than paper the drying end is much more extensive.

All paper is bought and sold on the basis of weight or "basis-weight". Basis-weight by definition is the weight in lbs. of a ream of paper. A ream of paper is equal to 3000 square feet of surface. The basis weight of paper is the number of lbs. per 3000 square feet. The basis weight of paperboard is the number of lbs. per 1000 square feet of surface. When ordering paper the customer can simply specify 35 lb. paper (for example) of such and such a thickness and the manufacturer can then supply it accordingly.

Thickness can be controlled by calendaring, pressing and the amount of fiber placed on the screen per second.

In the US 29 Million tons are produced annually and of that 19MM are fine papers. About 5.5MM tons are used in Packaging. The remaining paper is used in tissues and other applications.

KRAFT paper is characterized by a rough finish with a basis weight varying from 20-60 lbs. It is used extensively for Bags, envelopes, sealing tapes, laminated papers, multi-wall sacks, wax papers etc. KRAFT can be bleached. Bleaching weakens the paper but removes the brownness of the natural paper and makes a better printing surface.

GLASSINE or Grease proof paper are very dense papers made from hydrated pulp that are supercalendared. When used to wrap butter it is often coated or impregnated with wax to improve moisture resistance. While glassine alone is grease proof, it is not water resistant. (Discussion..... samples)

TISSUE is paper with a basis weight of 18 lbs or less. It is often used as a wrapper for protecting dry goods, flowers, candies fruit and other foods. Tissue can also be waxed for better moisture resistance.

CELLOPHANE is also a paper (Discussion and Samples)

PAPERBOARD has many varieties including Chipboard. Chipboard is used in making set-up boxes which include shoe boxes, candy boxes, stationary boxes, gift boxes etc. White lined chipboard is used to make cereal boxes, many varieties of folding cartons. Clay coated natural Kraft is a very strong paperboard and is moisture resistant. It is commonly used as beverage carrier for six-packs.

SBS (solid bleached sulphate) is 100% virgin bleached pulp that provides a strong white water resistant paper often used in folding cartons for frozen applications.

CORRUGATED is the largest use of paperboard in the Packaging industry.

Discussion and samples

ABCE&F flutes

Double and triple wall corrugated varieties.

98% of all manufactured items are shipped in a corrugated container.

WOOD

Wood is used when superior protection is required and often used in Industrial packaging applications.

A few luxury packages are still made from wood such a fine wine case, fine jewelry, fine cigars, special promotion items etc.

Some delicate instrumentation is also packaged in a foam lined wooden case.

The biggest use of wood in Packaging is pallets.

Wood for packaging must be fairly dry.

Freshly cut wood has only 30% of it's strength due to moisture.

At 12% moisture which is the level required to be "DRY" The strength of the wood will be doubled.

Wood fasteners are primarily nails and screws.

Nails that are cement coated increase their fastening strength by 40%. Nails that are threaded will increase their holding strength by 250% but the nails will cost more.

Types of wooden containers include:

Crates=apple crates to machine crates. They can be any size.

Barrels are used for many types of liquid or powder products. Barrels are usually bilged (center larger than the ends) which facilitates the tightness of the barrel and makes them easier to roll.

Wire bound boxes are for open air containers. They are typically received knocked down flat and erected by the end user.

Other materials of packaging include:

labels, tapes, twines, cushioning materials, coatings, inks, staples, etc.

Glass

What is glass?

It has the molecular structure of a liquid and the physical characteristics of a structure.

It is an inorganic, noncrystalline solid, formed by cooling from the liquid state, which shows no discontinuous change at any temperature. It simply becomes more rigid through a progressive change in its viscosity.

History of Glass

Glass is one of the oldest substances known.

Materials very much like it are found near areas of volcanic action.

It was sometimes used as arrow heads during the bronze age.

Glass beads found as early as 12000 bc.

7000 BC Egyptians used glass beads (amulets) to ward off evil spirits.

Story of sailors on shore with camp fire.

Used some blocks of soda from cargo to make a fireplace on the sandy beach. Soda fused with sand to make glass.

3000 BC glass bottles were being made sparingly in Egypt on display in the London Museum.

Molten strands of glass spirally wound to form containers. Fragile, small, and expensive and used only by the very wealthy to contain perfumes and oils.

1550 glass was an important industry in Egypt.

300 BC first glass blow pipe was used. Big breakthrough because large containers could be made with quality and precision.

"Finish" implies opening.

By 300 AD Romans were casting window glass on flat rocks.

Glass remained extremely expensive until around 1800 when the first machines were produced that convert molten glass into useable containers fairly fast. Glass became available to the average person.

1903 the first automatic bottle-making machine was invented by

M.J. Owens in the libby glass factory. Hence the name Libby-Owens so well known in glass manufacturing today.

Cheap bottles modernized milk distribution. Heretofore milk was delivered by a milkman with a large laddle who would poor it into your container.

Today 40 billion glass containers are produced in this country each year.

Today food packaging alone uses 12 billion containers. Beer 11 billion containers. Soft drinks about 9 billion containers. Health Care 2.5 billion. Cosmetics 1.3 billion.

Future is dependent on growth of plastics container industry and recycling efforts in glass.

Composition

Various oxides. Silica-Sand can make glass al by itself but does not have the most desirable container characteristics. It is hard to melt and hard to form, but it is strong. Soda can be added to lower the melting temperature and to lower the viscosity. But soda is expensive. Calcium can be added to make the container durable and lower the expansion rate. Lastly alumina can be added. devitrification

Sand-silica, Soda Ash-soda, limestone-calcium, Feldspar-aluminum trioxide or alumina

Manufacturing of glass bottles.

Raw materials are combined in a BATCH HOUSE above the furnace. Water is added.

The furnace consists of three principle parts: The melter, the refiner, the regenerator or checker. The melter section of the furnace is separated by a bridge wall. The wall has openings on the bottom (throat) and separates the melter atmosphere to the refiner atmosphere. Glass passes through the throat in a water cooled tunnel through the bridge wall. The refiner acts as a holding basin where the glass is allowed to cool to former temps before allowing the glass to enter the forming section. All the impurities float to the top so the bridge wall acts an impurity separator. They are periodically skimmed off.

Temperature ranges = 2700F for melting.

2100F-2400F for refining consistency of honey.

2000F for the forming phase

As glass exits the furnace going into the forming shapes they are called "GOBS". A GOB is a measured quantity of molten glass which will be formed into a glass container. Sizes may vary from 1/2 oz to 48 oz. 7 oz. is typical for a 12 oz. beer bottle. Speed of gob discharge through a single neck can vary from 30 gobs per minute to 150 Gobs per minute. The shape of the gob is critical in that it will affect the precision of the gob entry into the forming tube which has to accurate to maintain consistent quality. These shapes are controlled by plunger, height, stroke, size, shape, machine speed, temperature, orifice size, sheer cam, and tube height. Once the gob leaves the furnace it droops by gravity into the scoop. It is then routed to a section of the glass forming machine ready to receive it.

Once in the container forming section which can be between four to ten molds per machine, the temperature is about 2000F. It takes about 10 seconds to form and cool the average beer or soda pop bottle. As it is being formed the gob is called the "PARISON". The parison is the premature shape of the glass container which will be blown up to make the bottle. The finish, opening and threads at this point are shaped into it's final form. The body is hollow and the temperature is reduced to about 1700F. It is immediately transferred to its final mold and highly compressed air is forced into the opening pushing the parison into the final shape of the bottle (mold). Within seconds the mold is separated and the container is removed with tongs. When cooled the containers will go through annealing and a coating will be applied.

**EVALUATION AND SELECTION
OF
PACKAGING MACHINERY**

Donald C. Lindemann - Senior Packaging Engineer

LAND O' LAKES, INC.

PACKAGE SIZE AND WEIGHT:

The efficiency of a machine will be inversely proportional to the number of changes required. Package sizes and weights are very important and must be fully understood by the vendor. This may sound simple, but often the information is miscommunication or misunderstood by the machine manufacturer.

Even when a machine manufacturer understands the size limits the problems associated with mass and inertia can present problems.

Machines which index are especially vulnerable to package weight and inertia. A vendor may have a similar design running a small light weight package flawlessly, but substitute a heavy package and machine output could be reduced more than 50%.

The requirements for efficient, timely change overs need to be detailed up front. Often this is left to the end of the process when the change over problem is discovered in testing or left up to the vendor who has little understanding of the actual production needs. The ability for efficient change over has to be designed into the machine, not added on at the end. There are limitations on change overs. The range of sizes must be realistic or overall efficiency will be reduced. This limitation is best determined by the vendor and underscores the need to review package size ranges before starting design.

Future requirements, although difficult to predict, should be investigated early to insure the required flexibility is designed into the equipment.

SHIFT REQUIREMENTS:

Some plants operate on a continuous basis while others may only operate several shifts per month and others operate seasonally. The requirements for this range of conditions vary greatly.

A machine required to operate continuously requires much heavier construction. These machines usually have heavy tubular, structural, or solid bar frames. The operation is usually mechanical and all moving parts are hardened or plated to reduce wear.

Lighter duty machines will have formed steel frames, rely heavily on pneumatic cylinders and valves, and parts are usually painted or mill finish.

It is necessary to properly establish running parameters. Buying a machine oversize will usually be more costly, but buying a machine undersize will be very expensive.

PACKAGING MATERIALS:

Packaging materials play a critical role in the success or failure of a machinery project. The best designed and built machine may not be able to run materials which are inconsistent or out of specification. The specification needs to reflect the machinery requirements as needed and the packaging material supplier should play a part in the project team. It is necessary that both the materials and machinery vendors know each others specifications and limits. Aside from the usual dimensional specifications, items such as stiffness, static electricity, score types, orientation, or die types must be clearly defined and places in writing for future reference.

Examples: tubes
corrugated boxes or liners
center of gravity on plastic parts
recycled materials

COST:

Most companies have cost guidelines to follow on capital projects. It is important to stress the cost analysis should try to include a life cycle analysis to determine the true costs , including purchase, operating, and maintenance cost and life expectancy. An examination of equipment use in both the present and the future should be considered. For example retooling a machine for a new product may not be possible with some equipment.

When performing the financial analysis, the machinery selection should be based on what is the best equipment for the job. Then, if necessary, what compromises need to be made to fit the financial goals of the project. Buying what seems to be the least expensive can sometimes be the most expensive. The same consideration should be given to options presented by the manufacturer.

MACHINERY**GENERAL REQUIREMENTS**

FDA

USP

TYPE OF MOTION

INTERMITTENT

CONTINUOUS

LAYOUT

INFEEED HEIGHT

DISCHARGE HEIGHT

MACHINE SUPPORT DESIGN

LEG STYLE

FLOOR CHARACTERISTICS

CLEANING REQUIREMENTS

MATERIAL FEED

MAGAZINE STYLE

MAGAZINE SIZE

CODE DATING

TYPE (JET, FLEXO, STAMP)

BRAND / SUPPLIER

MOUNTING LOCATION

SIZE AND COLOR

GENERAL CONSTRUCTION

FRAME MATERIAL

CONTACT PARTS

SANITARY DESIGN

HAND WHEELS

HARDENED SPROCKETS

SPLIT SPROCKETS AND CAMS

CONTINUOUS WELD / SKIP WELD

VACUUM SYSTEM

BRAND / TYPE

GEAR BOXES

BRAND / FINISH

PNEUMATIC VALVES AND CYLINDERS AND REGULATORS

BRAND / TYPE

CHANGE OVER / CHANGE PARTS

PART NUMBERS

LOCATION NUMBERS

SCALES

INDICATORS

OPERATING MANUALS

OTHER CONTROLS

SURGE CONTROLS.
LEVEL CONTROLS
STACK OR WARNING LIGHTS
DELAY START OR HORN
TOUCH SCREEN

CONTROL PANELS

LOCATION
CONTROL STATIONS
NUMBER AND LOCATION
EMERGENCY STOPS
BRAND
TYPE
NUMBER
LOCATION
PULL CORD
PUSH BUTTONS AND LIGHTS
BRAND
TYPE
DISCONNECTS
BRAND
TYPE
INTERIOR PANEL LIGHT
110 VOLT PLC OUTLET
INTERIOR / EXTERIOR
PLC PROGRAMMING OUTLET
STARTER RESETS
CIRCUIT BREAKER / FUSES
BRAND
TYPE
ISOLATION TRANSFORMER
PANEL FINISH
ADDITIONAL ROOM IN PANEL
WINDOW IN PANEL

MACHINERY SAFETY / GUARDING

ELECTRICAL DISCONNECTS
POLICY
QUANTITY
MECHANICAL DISCONNECTS
PNEUMATIC LOCK OUTS
MECHANICAL LOCKS
EMERGENCY STOP WIRING PRACTICE
GUARDING SWITCHES
TYPE
BRAND
SAMPLING REQUIREMENTS
INSURER REVIEW

FRAME

STAINLESS STEEL
 GALVANIZED
 PLATED
 POWDER COAT
 PAINT

EPOXY / POLYURETHANE / RUBBER
 ENAMEL
 COLOR
 BRAND
 SUPPLIER

GUARDS

STAINLESS STEEL
 CHROME PLATED
 FIBERGLASS
 POWDER COAT
 PAINT

EPOXY / POLYURETHANE / RUBBER
 ENAMEL
 COLOR
 BRAND
 SUPPLIER

ERGONOMICS

OPERATOR LOCATION
 OPERATOR DUTIES
 SUPPLIES
 OPERATOR INFORMATION
 OPERATOR MOVEMENTS
 PACKAGE WEIGHTS
 QUALITY ASSURANCE REQUIREMENTS

SHIPPING AND RIGGING

INSTALLATION REQUIREMENTS
 DOOR SIZES
 RIGGING REQUIREMENTS
 CRATE CONSTRUCTION
 SHIPPING CONSTRAINTS

CONTROLS:

Most machines built today have some form of programmable logic controller (PLC) whether required or not. Manufacturers try to use the PLC as a selling point regardless of application. A PLC can be a very useful asset, but careful selection is required. Pricing and manufacturers vary widely. Packaging machinery manufacturers tend to use systems that are cost effective for them and not the purchaser. PLC capabilities also vary widely even from the same manufacturer. These differences can include maintenance, communications, and external options. Software compatibility with existing plant systems need to be examined also.

Use of a PLC almost requires the use of an optional display. Without the display, trouble shooting will programming ability and familiarity with single line drawings. Skills not usually required from operators. The display will indicate status and trouble conditions. These systems are reliable but require good programming to be effective. Compatibility of the PLC and the display is important.

Mechanical and electromechanical control are rare today, but can still be found on some equipment.

Pneumatic and fluidics controls are used predominantly on machines in hazardous environments. While necessary for some applications these controls are bulky and slow, and subject to malfunction caused by water, oil, or dirt in the air system. This is especially true with fluidics. Some plants prefer pneumatic controls since they are easy to troubleshoot and electricians are not required.

Many machines use A/C frequency drives. Although troublesome in the past, most new ones perform satisfactorily. Beware of inexpensive drives and turn down ratios in excess of 2:1. This can lead insufficient motor cooling and burnout. Direct current variable speed drive are very reliable and more flexible, but usually more expensive and bulky.

Programmable limit switches are used on some machines to replace multiple control limit switches, timers, and mechanical cam switches. A PLS greatly increases flexibility and reliability, since limit switches mounted within the machine are replaced with a simple shaft encoder which indicates machine position. PLS data can then be directly feed into the PLC or in some cases used independently. If the machine does not require elaborate controls or shift registers the PLS can be used instead of a PLC.

SERVICE FACTOR:

Service factor is difficult to define in terms of the overall packaging machine. For this purpose it should be the amount of abuse and neglect the equipment will tolerate. Some machines are easily damaged by minor jams, and repairs can be frequent and expensive.

Product and material jams or faults on packaging machinery are inevitable, and the machine should be designed strongly and equipped with safety devices to prevent damage to the machine and injury to the operator. Notice how the parts are made, such as guide rails, adjusting shafts etc. Look for clutches or safety switches to shut down the equipment in case of problems. Look for small parts or connector which may be easily damaged and go unnoticed until more serious problem erupt. Each part or section should be examined for potential problems and durability. Every machine will probably have several areas where problems might occur and the ability to restore operation safely and quickly is important in machine evaluation.

MAINTAINABILITY:

One key item in maintainability is the service manual and parts list. A number of companies have very good ones, and some have very poor ones. A good one will usually be quite large, consisting of data and drawings of all components used in the manufacture of the machine. In addition, it should also include machine specific information consisting of drawing of assemblies, key parts, electrical and control diagrams, and photographs of key machine maintenance and adjustment areas. A detailed parts list with recommended spares should also be included. The manual should also include a recommended maintenance and lubrication schedule. A good manual can decrease downtime, reduce spares inventories and improve efficiencies, but be patient because to do it right it will probably lag equipment delivery by several weeks. How a vendor handles the area of service manual and spares list should be part of the initial vendor selection. The amount of pride and detail included in the manual usually reflects in the machine itself.

Most manufacturers will offer a cluster type lubrication system as standard. This system brings lubrication fittings to one or more locations on the outside of the machine. These systems should include color coding for frequency and type of lubrication. Special lubricant requirements may require special equipment and should be identified early to avoid added expense, field changes and clean outs.

Automatic lubrication systems are usually considered options, and may require as much labor as manual systems, since they require close inspection to insure against over and under lubrication. Machines with limited access in critical areas may be able to use single point automatic systems. Several are available which are spring loaded or pressure activated.

Other points to consider when evaluating maintainability are access to parts. Items such as

ENVIRONMENTAL IMPACT:

Environmental impacts are water, waste, dust and noise. Machinery specifications should state the amount of cooling air or water required, waste generated, and dust or air extraction flow rate required. This is another area manufacturers tend to omit or understate. Noise also needs to be evaluated. Fans, vacuum and hydraulic pumps, and solenoid valves can create an intolerable and possible illegal noise condition. Just the addition of another noise source in the area may raise the overall noise level to problem level. Noise producing equipment should be supplied with suitable mufflers or enclosures as required.

SAFETY, MAINTENANCE AND RELIABILITY:

SAFETY:

Every machine needs a safety operations review. Some manufacturers do this internally, which is a big step forward, but there may be areas which get overlooked. While an internal review is good, another useful source is the plant insurance carrier. Many insurance companies hire or have loss prevention consultants to work with clients in improving plant safety.

The safety review should consist of a review of guarding, operation analysis, shut down and lock out procedures and clearing of overloads and resets.

A rapidly growing area is ergonomics. Such things as magazine or material loading heights, reach requirements, jam clearing and control locations need to be considered. Lacking experience in this area, an insurance loss control expert can be helpful.

MAINTENANCE:

This area was covered in discussing maintainability. The manufacturer should be able to provide a suggested maintenance schedule and spare parts list. Spare parts availability should be discussed with the vendor. This should include locations of spares, inventory levels and service locations and availability. It is also helpful to understand the requirements and costs for major overhauls to estimate the true cost of machine ownership.

USING STATISTICAL PROCESS CONTROL:

Statistical process control can be a useful tool in making a decision on selecting packaging machinery. Obtaining a basic knowledge of statistical process control will require study period of several days. Courses on the subject are available from several sources. SPC can be used to evaluate filling accuracy and other data. It will prove the system capability to meet requirements. Testing will require a minimum of one hundred sample points, but the results will be significant. The enclosed charts indicate the large difference which can exist between machines which is not apparent from the raw data alone.

PURCHASING:

To complete the evaluation a spreadsheet rating form can be very helpful. It should include all the major selection or rating points as well as cost. It should also include an estimate of potential start up and training costs. A ten point rating system should be used in comparing areas which can not be quantified. After all the information has been evaluated a preferred vendor should emerge. The final purchase order require all details be documented or clearly referenced, including sizes, speeds, outputs, ranges, voltages controls, options, warranty terms, and finishes.

Approximately one-half of all packaging material in the USA, both volume and value, are used for food and beverage packaging. The percentage of disposable income spent on food in the United States is about 16% and, when compared to Western Europe at 32% and some South American countries that are as high as 85%, it makes the USA's food costs very favorable. The United States is in a unique position in that it has available a wider variety and greater abundance of food than any other country in the world. This availability is attributed extensively to advances in food processing, package technology, and marketing. In the USA there are over 25,000 different food processing companies, not including the 4,000 beverage firms that are bottling carbonated and still beverages of all types. The processing companies service some 300,000 retail food stores which includes 4,400 supermarkets and 35,000 self service stores that have 90% of all sales of food and beverage for home consumed foods. A unique thing about food and beverage packaging is that it has to compete for the shopping dollar and it still must protect the product. The food package must be pleasing to the consumer and must provide directions, utility and assist in shelving or display and still be within government, federal, state and local compliance. Marketing studies indicate that the package alone will influence the first sale of an item and, if that product is accepted by the consumer, the product will generate resale, and the package will then stand as an identifier and protector. The unique thing about food is that it must be available year round in an interesting variety, irrespective of the food growing season. Foods must be presented in a way that is convenient to purchase

and use, and in most instances, this means that it must be packaged. The single factor requiring food packaging is availability.

When packaging departments search for proper package materials for items, they must know four sets of facts to successfully package the product. First, they need to know about the product—the materials and the manner in which these materials can deteriorate, the size and shape of the product, the weight and density of the product, the overall weakness, breakability, bendability and integrity of the product, and how the product is to be used. Second, they must know the transportation hazards, whether the product is sensitive to heat, cold, vibration, shock and how much stacking height can the product within the package tolerate. Third, the market must be taken into consideration. They must know market lighting, the shelf life under normal storage conditions, display conditions, shelf size, location, and how high they would normally be stacked on a shelf. Fourth, they must know the forms of packages that are suitable, the machinery that's available for this packaging system, and the labor that is required to fully package and distribute the product.

Fresh fruits also need packaging. The saying about fresh fruits is that life begins at 40, meaning that above 40 degrees fahrenheit microorganisms start to thrive and cause an accelerated deterioration of fresh fruits.

Most red meats require oxygen to produce an attractive surface. If red meats are stored in an oxygen free environment, the surface of the meat will be less attractive and less likely to be selected by the consumer at a self service store. Most meats must be quickly cooled down to 50 degrees fahrenheit as soon as possible and then held at about 34 degrees fahrenheit, which is considered to be the best holding temperature. Beef and veal can be held for 21 days without suffering deterioration. Lamb can only be held for about 15 days, pork 14 days, poultry 7 to 10 days, and internal organs such as liver and kidneys, only 7 days. The quality in storage is effected by the growth of microorganisms, enzyme activity and oxidation, all of which can be slowed down by lower temperatures.

Fish products are the most susceptible to spoilage. The bacteria in seafoods are cold loving that can be active at temperatures below 40 degrees, therefore, when first harvested from the sea, these products must be packed in ice right away. Spoilage of seafoods can occur within two to three days from harvest and must be kept at near freezing temperatures.

Fruits and vegetables are unique in that they are still alive after harvest. They continue to respire by taking up oxygen and giving off carbon dioxide. They tend to be bulky, taking up a lot of space and are easily damaged by handling. Most are water based. This water can easily be lost which decreases the look and quality of the fruit and vegetable. The deterioration of fruits and vegetables starts from the time they are harvested. They are damaged both by heat and cold, and affected by oxygen, carbon dioxide, ethylene gas and other volatiles in the atmosphere. Packaging of fresh fruits and vegetables is based on a need for easy handling for distribution and the need to be chilled to reduce respiration. Fresh fruits and vegetables have two types of spoilage and deterioration. First, there is the biological spoilage which is the normal process of aging, and second, there is an anaerobic spoilage which is due to internal reactions that will result in off-flavors, off-colors and off-textures.

Processing and packaging of some fruits and vegetables can be done. Some products can be heat processed, which destroys microorganisms like retorting canned goods, pasteurization of milks, juices and other beverages, irradiation sterilization all of which kills microorganisms. Food and beverage irradiation does not leave a toxic residue but there is public concern about its use. In the USA, irradiation is mostly used for sterilization of medical devices after they have been packaged, and very few food items are radiated. Foods can be refrigerated or frozen which slows or stops the natural processes of deterioration. The package for frozen foods serves to keep out other microorganisms and to control freezer burn. Some food products can be dried and chemically processed. Drying reduces water content to the level that microorganisms cannot live. Drying is used for pasta, freeze dried foods, beef jerky and others. Chemically processed foods are mostly salted and packaged in a vacuum package that is free of oxygen and is used for bacon, ham and others.

The food and beverage package has to be unique to the product, to its properties, to exclude gases and moisture, or in some cases, to allow penetration of some gases and moisture. In the future, food packaging will continue to receive emphasis because of its large market. The trend may be towards more microwavable food items in smaller unit size packages for easy convenience of use especially for smaller families and working families. In the future there should be an emphasis on providing more convenience and better quality of packaged foods and beverages.

C. Report by SUSTAIN Volunteer John Nelson

Thursday 9/8, arrival in Lusaka allowed me to take part in the field trip to the alligator farm and to meet many of the participants and resource people.

Friday 9/9, we heard about the NW Honey Cooperative. They produce honey and beeswax and have Autumn Harp as a customer. This is an enterprise of 189 groups of beekeepers privatized in 1988. The two manager, one of whom is from Oxfam, gave the group a very complete report. In the late morning and after lunch, I facilitated presentations by ten representatives of various NGO's. I made the final presentation of that session explaining how SUSTAIN functions. Of particular interest was David Martella's description of USAID's initiative for Southern Africa (ISA) funded at \$100 million for ten years.

Monday 9/12 started with Dr. Mazuru Gundidza, Professor at Zimbabwe University. His presentation was extremely interesting and thorough describing medicinal plants, poisonous plants and seed, and essential oil products. He closed by mentioning indigenous fruits and vegetables that could be marketed and plants that produce natural dyes. Rob McCaleb dealt with market trends and requirements for medicinal herbs followed by Don Lindemann's presentation on packaging.

My presentation added to what Rob presented and was specifically aimed at spices and oleoresins with a reference to essential oils. I covered the USDA statistics on spice movement in the U.S. and presented McCormick specs for eight spices being sourced from Africa. The trend from wild harvest to industrialized production was discussed, including how direct sourcing is the goal of the major purchasers. As a 'lead in' to the marketing discussion on Tuesday, I discussed product life cycles, barriers to entry and the need for a point of difference. The final paper was by Norman Chipakupaku who described the need for marketing and the necessity for regional networking.

Tuesday 9/13 began with my marketing presentation and discussion. The discussion was extensive because the four product related groups that had been formed each had to develop their own marketing plans. The groups worked individually in the late morning. In the afternoon the subject was business and financial planning. The final presentations of this day were short statements from representatives of organizations active in local funding.

Wednesday 9/14 Rob and I started with presentations on quality control and quality management. Dr. Duke then covered medicinal plants from a very broad perspective. The remainder of the day was spent tutoring the groups on their business, marketing, financial, and packaging plans.

Thursday 9/15/ was the day the groups made their presentations. It was clear that the participants worked hard to utilize their new knowledge.

John Nelson's Presentation Materials

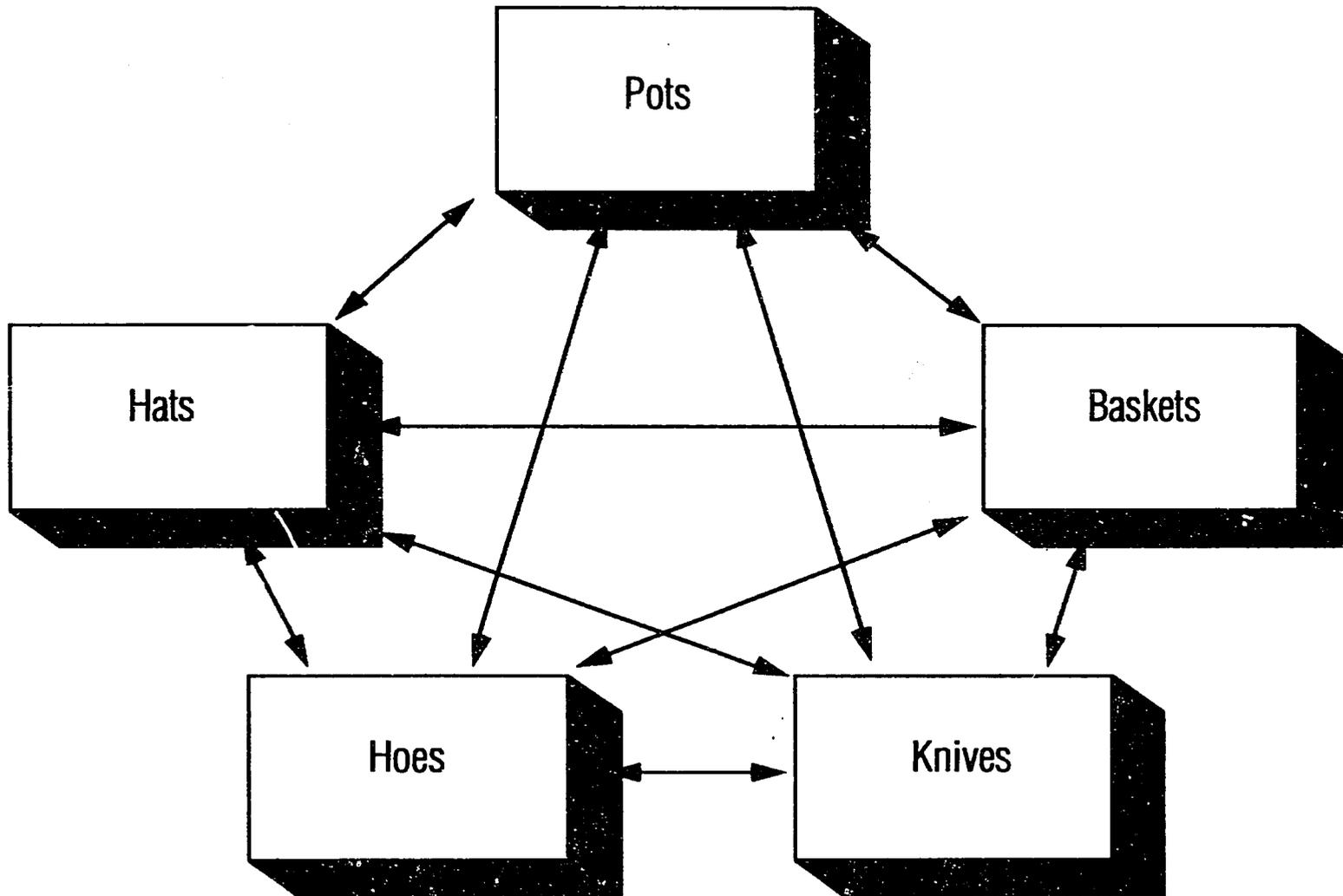
Practical Marketing

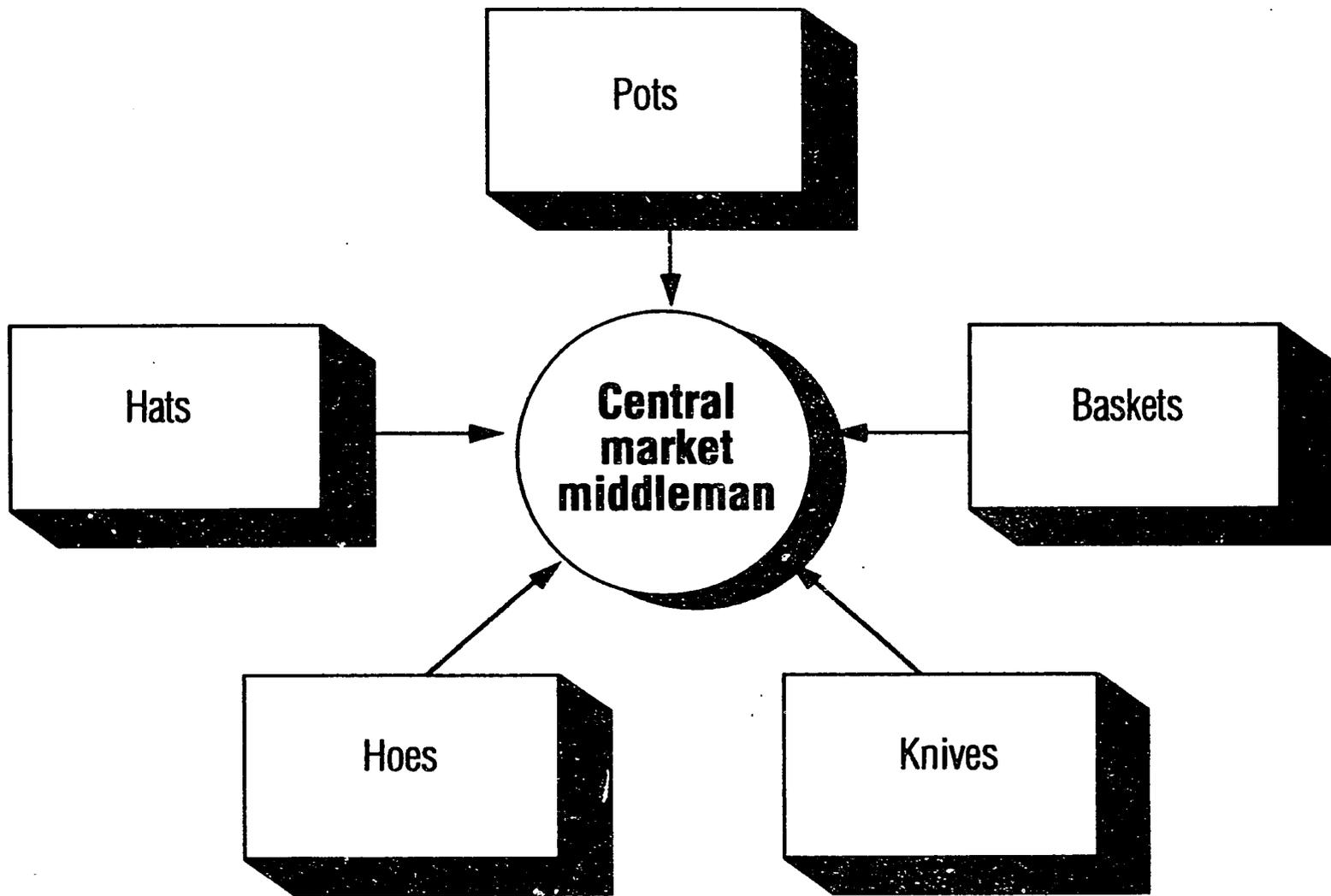
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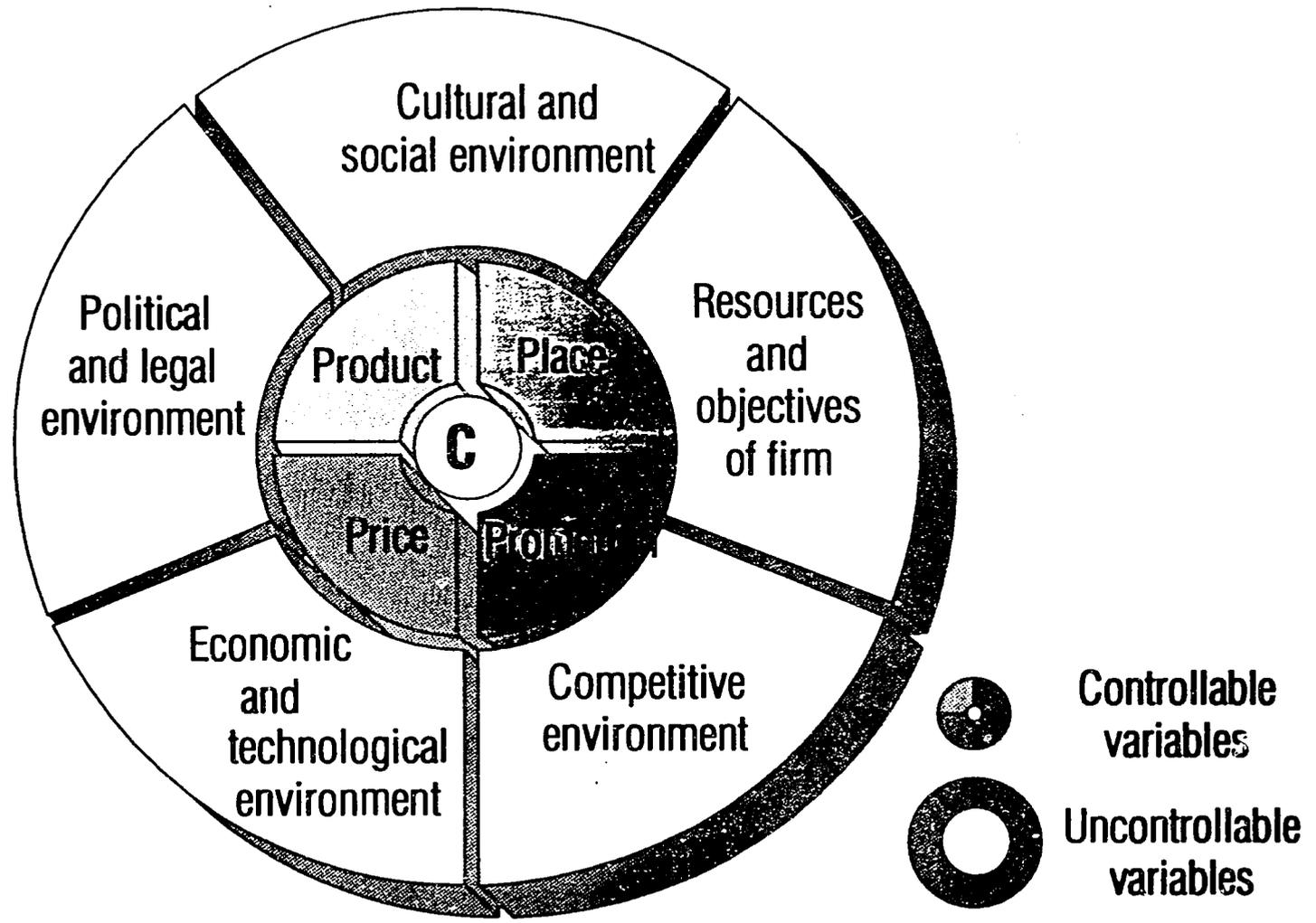
September 5 - 15, 1994

Lusaka, Zambia

Presented by John Nelson, Ph.D.

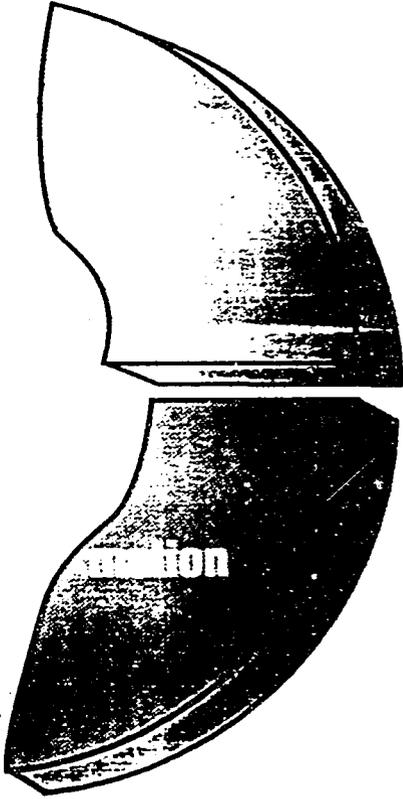
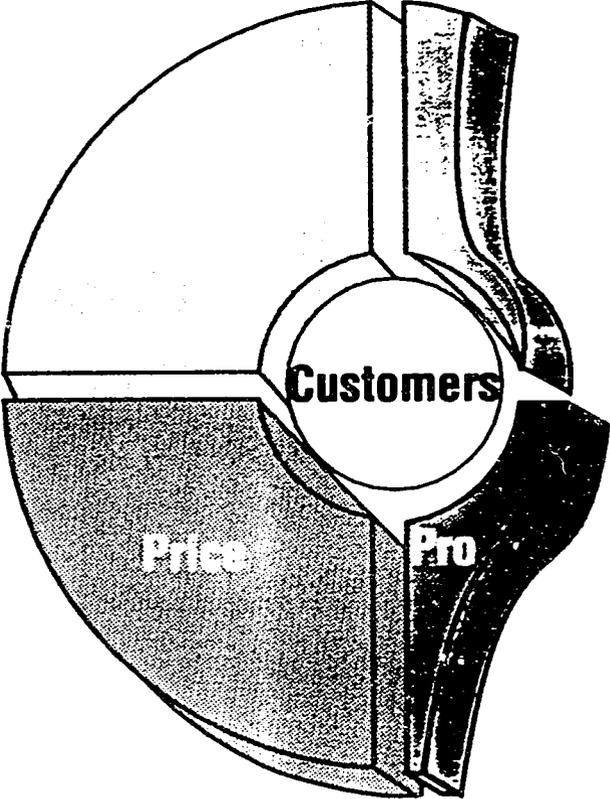


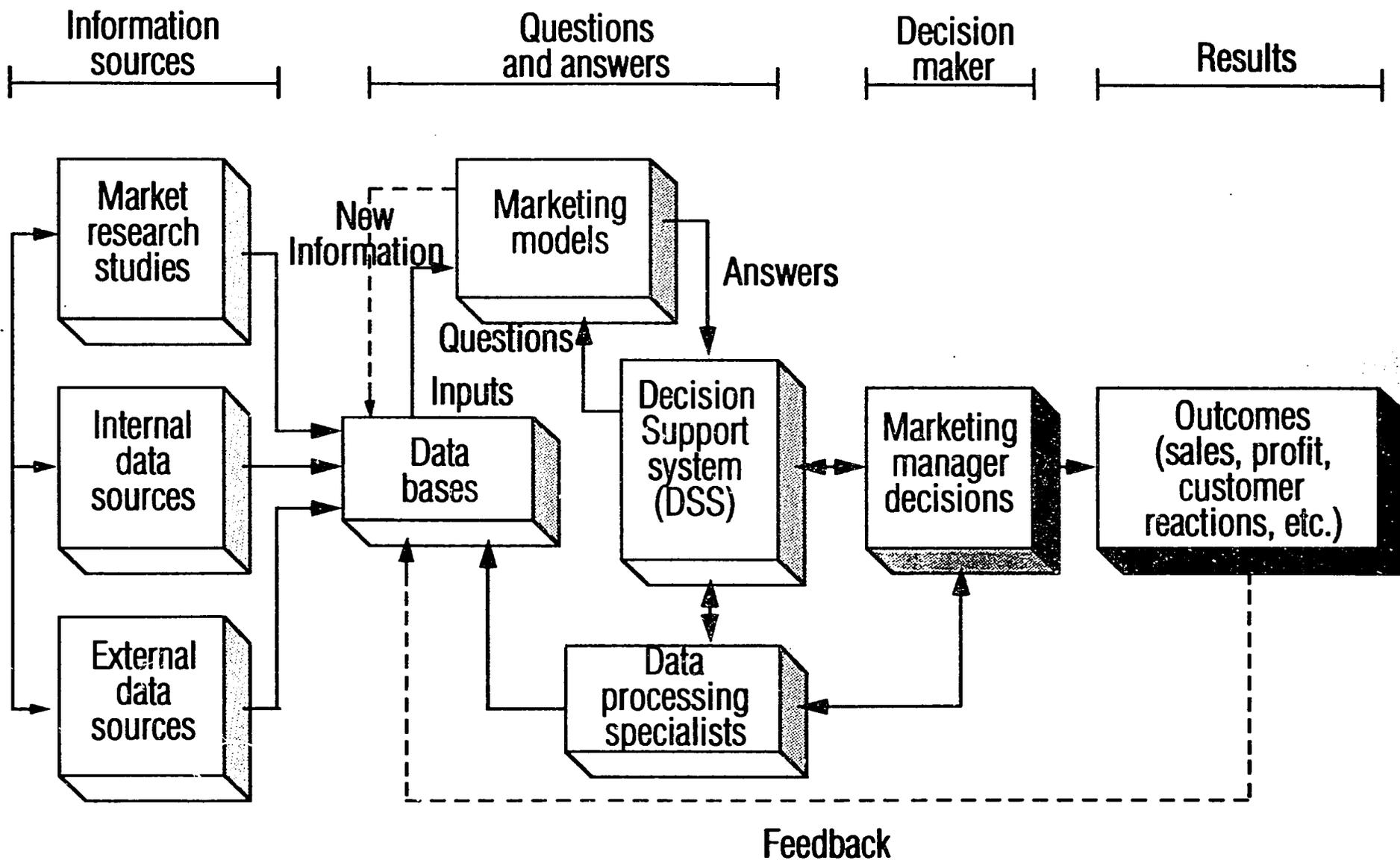




Producer's part of the job

Middleman's part of the job





Potential target market dimensions

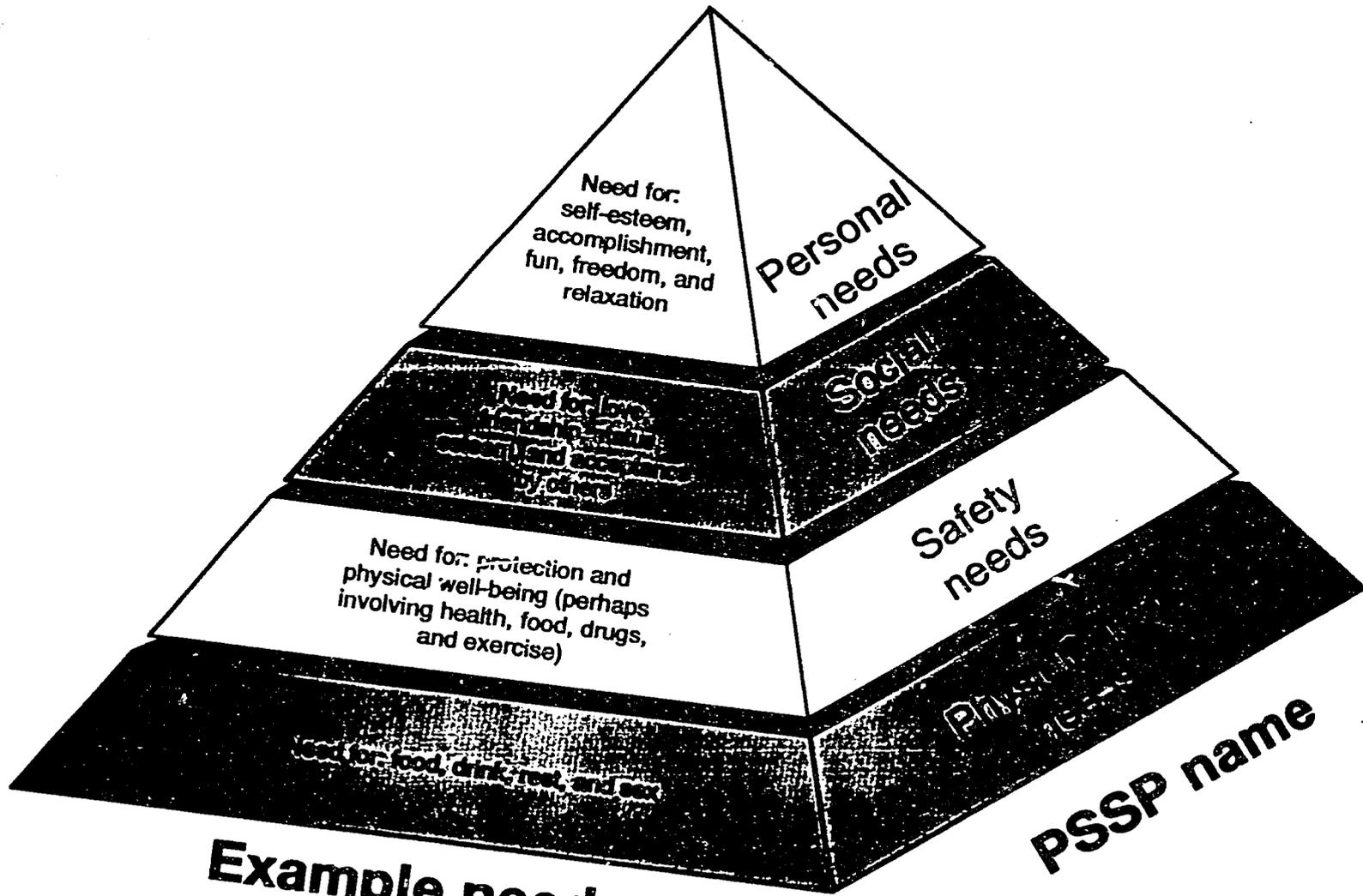
1. Geographic location and other demographic characteristics of potential customers
2. Behavioral needs, attitudes, and how present and potential goods or services fit into customers' consumption patterns
3. Urgency to get need satisfied and desire and willingness to compare and shop

Effects on decision areas

Affects size of *Target markets* (economic potential) and *Place* (where products should be made available) and *Promotion* (where and to whom to advertise)

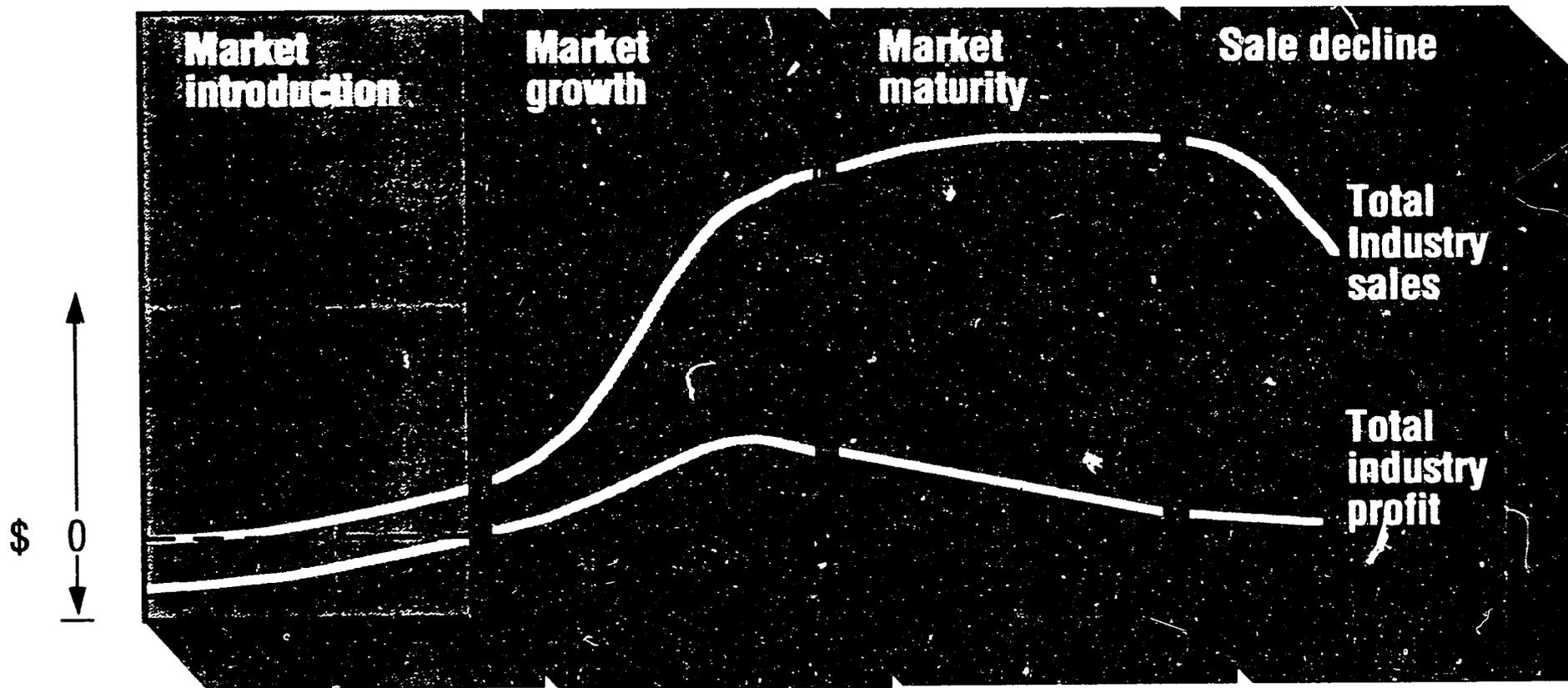
Affects *Product* (design, packaging, length or width of product line) and *Promotion* (what potential customers need and want to know about the product offering, and what appeals should be used)

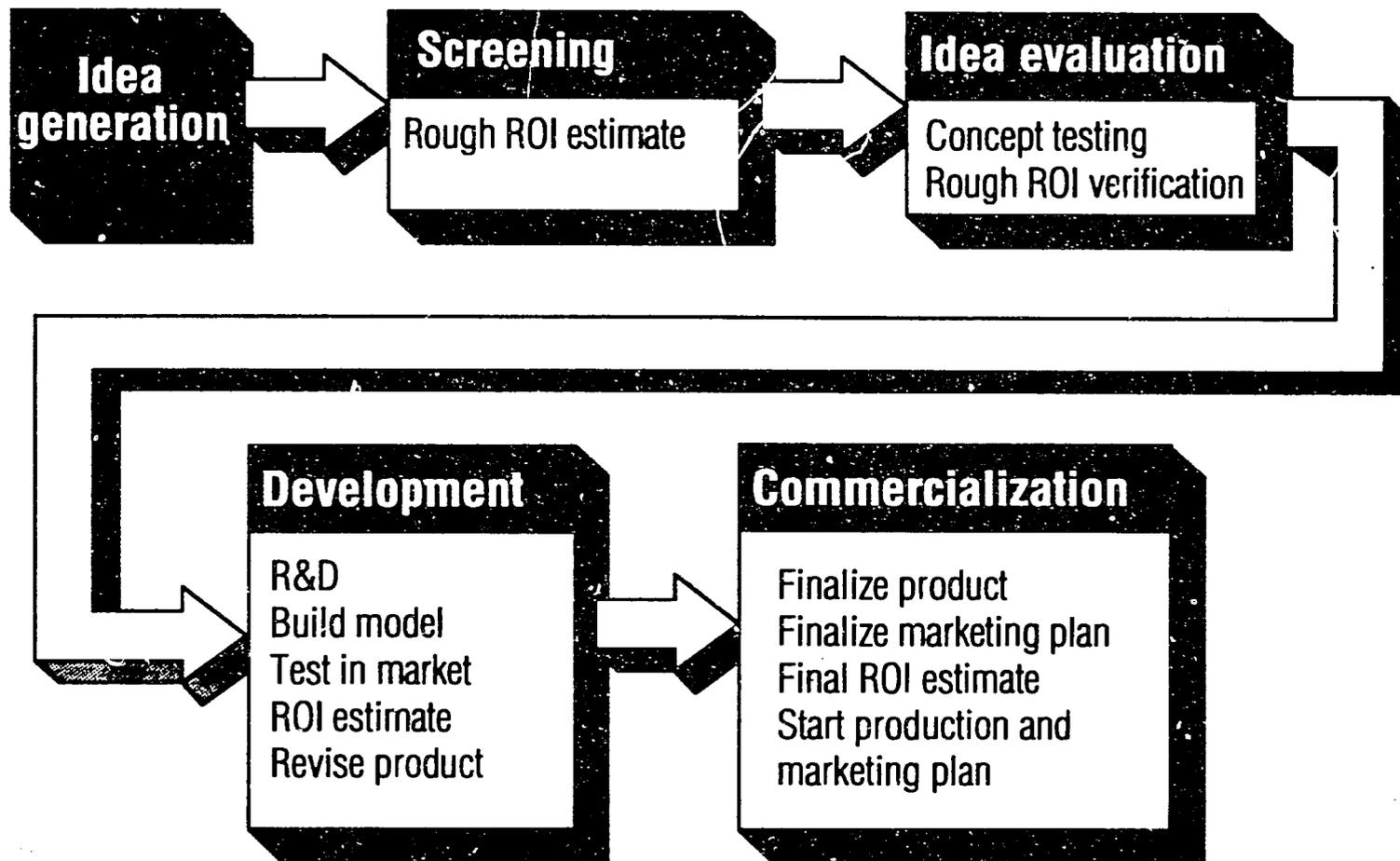
Affects *Place* (how directly products are distributed from producer to consumer, how extensively they are made available, and the level of service needed) and *Price* (how much potential customers are willing to pay)



Example needs

PSSP name





Important dimensions	Types of Situations	Pure competition	Oligopoly	Monopolistic competition	Monopoly
Uniqueness of each firm's product		None	None	Some	Unique
Number of competitors		Many	Few	Few to many	None
Size of competitors (compared to size of market)		Small	Large	Large to small	None
Elasticity of demand facing firm		Completely elastic	Kinked demand curve (elastic and inelastic)	Either	Either
Elasticity of industry demand		Either	Inelastic	Either	Either
Control of price by firm		None	Some (with care)	Some	Complete

Topic	Marketing orientation	Production orientation
Attitudes toward customers	Customer needs determine company plans	They should be glad we exist, trying to cut costs and bring out better products
Product offering	Company makes what it can sell	Company sells what it can make
Role of marketing research	To determine customer needs and how well company is satisfying them	To determine customer reaction if used at all
Interest in innovation	Focus on locating new opportunities	Focus is on technology and cost cutting
Importance of profit	A critical objective	A residual what's left after all

(continued)

Topic	Marketing orientation	Production orientation
Role of customer credit	Seen as a customer service	Seen as a necessary evil
Role of packaging	Designed for customer convenience and as a selling tool	Seen merely as protection for the product
Inventory levels	Set with customer requirements and costs in mind	Set with production requirements in mind
Transportation arrangements	Seen as a customer service	Seen as an extension of production and storage activities with emphasis on cost minimization



PRODUCT DATA

McCORMICK INGREDIENTS • BRINGING YOU THE WORLD'S MARKETS

NATURAL SPICES & HERBS

ITEM	TYPE	KEY CONSTITUENTS
Allspice	W, G, C	3.0% VO
Anise	W, G, C	1.5% VO
Basil	W, G, C	0.4% VO
Bay Leaves	W, G, C	1.0% VO
Caraway	W, G	1.5% VO
Cardamom	G	3.0% VO
Celery	W, G	1.75% VO
Chervil	W	N/A
Cilantro	W	N/A
Cinnamon	W, G, C	1.0%–3.0% VO
Cloves	W, G	15.0% VO
Coriander	W, G, C	3.0% VO
Cumin	W, G	2.0% VO
Dill Seed	W, G	2.0% VO
Dill Weed	W	0.2% VO
Fennel	W, G, C	1.0% VO
Fenugreek	G	N/A
Ginger	W, G, C	1.5% VO
Mace	G	12.0% VO
Marjoram	W, G	0.6% VO
Mustard	W, G	0.2%–0.7% VO
Nutmeg	W, G	7.5% VO
Oregano	W, G, C	2.0% VO
Paprika	G	60–120 CU
Parsley	W, C	N/A
Pepper Black	W, G, C	1.5% VO
Pepper Red	G, C	10,000–60,000 HU
Pepper White	W, G, C	1.0% VO
Poppy	W	Non-Volatile Oil 35.0%
Rosemary	W, G, C	1.0% VO
Saffron	W, G	N/A
Sage	G, C, R	1.0% VO
Savory	W, G, C	0.5% VO
Tarragon	W, G	0.3% VO
Thyme	W, G	0.8% VO
Turmeric	G	3.5% VO, Curcumin 5.0%–6.6%

OLEORESINS & ESSENTIAL OILS

OLEORESINS	KEY CONSTITUENTS
Allspice	37% VO
Basil	3% VO
Bay	5% VO
Capsicum	250,000–1,500,000 HU
Celery	8%–12% VO
Cinnamon	30%–70% VO
Cloves	65% VO
Coriander	5% VO
Dill	10% VO
Ginger	28% VO
Mace	20% VO
Marjoram	6% VO
Nutmeg	30% VO
Oregano	15% VO
Paprika	40,000–100,000 CU, OS and WS
Parsley	3% VO
Pepper Black	18%–22% VO, 36%–42% Piperine
Rosemary	5% VO
Sage	6%–30% VO
Thyme	7% VO
Turmeric	30%–38% Curcumin
Turmeric	5.5%–15% Curcumin, WS
Turmeric Pwd	90%–97% Curcumin

ESSENTIAL OILS

Anise	Clove	Nutmeg
Basil	Coriander	Oregano
Bay	Cumin	Parsley
Caraway	Dill Weed	Pepper Black
Cardamom	Fennel	Pimento
Cassia	Ginger	Sage
Cinnamon Leaf	Mace	Thyme
Celery	Marjoram	

TOMATO POWDER

Standard Grind	Hot Break
Fine Grind	Flakes

KEY: C-Cracked, Crushed, Chopped, or Cut; CU-Color Units; G-Ground; HU-Heat Units; OS-Oil Soluble; R-Rubbed; VO-Volatile Oil; W-Whole; WS-Water Soluble;



McCormick Ingredients

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Tel: 800-255-5080, Fax: 410-771-5089

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suggestions are made without warranty of any kind, either expressed or implied. Purchasers are urged to make their own tests and investigations to determine the effectiveness of the products in their processes, in their products, and to prevent any possible patent liability arising out of such use.



PRODUCT DATA

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Illustration Courtesy of: American Spice Trade Association.

BAY LEAVES

Spice Description

Bay Leaves or Laurel are the dried leaves of the evergreen *Laurus nobilis*. The elliptically shaped leaves are light green in color and brittle when dried. They have a distinctively strong, aromatic spicy flavor.

What To Look For

The quality of Bay Leaves can be assessed by:

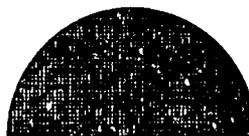
- Appearance: overall cleanliness
- Color: dull green
- Flavor & Aroma: aromatic & pungent
- Volatile Oil: Eugenol being the principal contributor to the spice's flavor and aroma.

Forms And Common Usage



Whole

Bay Leaves are used in soups, chowders, pickling, steaming, boiling or poaching fish and shellfish, tomato juice, custard sauce, French dressing, marinades, water for cooking vegetables, and when preparing aspics, pot roast sauerbraten, game, variety meats and stews. The strength of flavor increases with amount used and cooking time. Bay Leaves are usually removed from food when cooking is completed.



Ground

Mesh Size #50

Suggested usage levels for various dishes:

- (10 medium Bay Leaves = 2.3 g.)
- 2 Bay Leaves for ½ gallon of bouillabaisse.
- 1 crumbled Bay Leaf for 3 pounds spareribs.
- 3 Bay Leaves in ½ gallon of hearty bean soup.
- 2 Bay Leaves in 1 gallon of codfish chowder.
- 1 Bay Leaf for 2 pounds of lamb.
- 2 Bay Leaves for 1½ pounds of eggplant parmigiana.
- 1 Bay Leaf for 4 cups of French onion soup.
- 1 Bay Leaf for 5 cups of spaghetti sauce.
- 1 Bay Leaf for 4 cups tomato-vegetable soup.

Product Description

Bay Leaves are native to the Mediterranean area. Turkey produces virtually all Bay Leaves imported into the United States.



Harvest/Shipment from Source



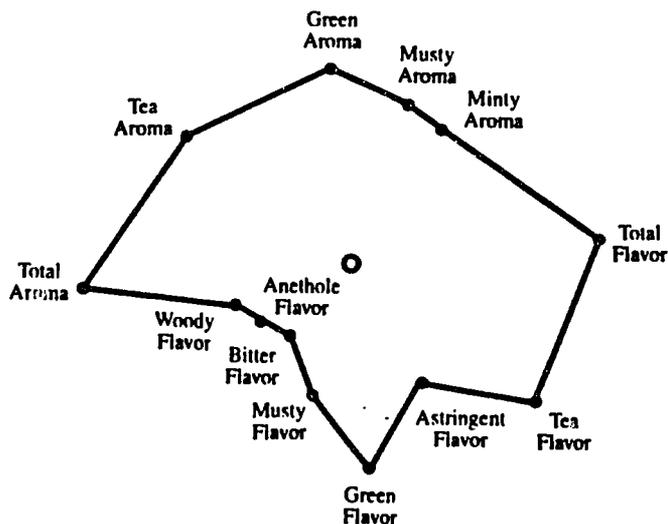
New Crop Generally Available in the United States

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Turkey												

Sensory Profile

Bay Leaves, often described as tea-like, are characterized by a green, woody and astringent flavor. They have a pleasant, slightly minty menthol aroma. McCormick utilizes sensory evaluation techniques to graphically illustrate the intensity of flavor notes in Bay Leaves.

For a description of the sensory evaluation methodology, please write: McCormick Ingredients
10901 Gilroy Road
Hunt Valley, Maryland 21031-1307



The farther from the center, the more intense the flavor note.

Specifications

The following table is representative of major products offered; however, McCormick can and does engineer customized products to comply with exacting customer specifications:

	774295 Ground	600028 Whole	760257 Cut & Sifted	773309 Ground
Origin	Various	Turkish	Turkish	Turkish
Particle Size	90% min. thru USS #50	Whole	1/8" to 3/4"	10% max. on USS #50 50% min. thru USS #100
Volatile Oil (min.)	1.0%	1.0%	1.0%	1.0%
Moisture (max.)	12.0%	9.0%	9.0%	9.0%
Standard Plate Count	Bacteria Treated	10,000	10,000	10,000
Packaging	Box	Various	Various	Various

Spice Alternatives

McCormick offers all-natural alternatives for virtually all spices. The Bay Leaves flavor is available in the following forms:

	Description	Code	Solubility	Remarks	Flavor Strength
Spice-Cap®	Encapsulated Spice extractive extended on a salt or dextrose carrier	F30064 (Dextrose) F20466 (Salt)	Water	Excellent shelf life Instant flavor release	1 Fold
Flavor Cap®	Encapsulated Spice oils and oleoresins	F30003	Water soluble and oil dispersible	Excellent shelf life (dry) Instant flavor release in water available	9 Fold
Solu-Flow®	Liquid containing natural flavor and emulsifier	F46467	Complete solubility in water or oil	Instant flavor release Water solubility with clarity	2-3 Fold
Oleoresin	Concentrated extracts containing complete flavor profile of the spice	F45016	Oil	5% min. volatile oil	40 Fold

McCormick food technologists can apply spice alternatives singly or in blends to solve any taste challenge. Whichever you choose: reliable service, consistent quality,

and freedom from bacteriological concerns are positive attributes of these products.

Blends Available

Bay Leaves commonly flavor marinades, stews, fish, meats and pickling mixtures. They can also be infused into milk for sweet or savory dishes.

McCormick can simplify your production process by preblending products tailored to your specifications. By calling upon our expertise, greater efficiency and

opportunities for significant cost and time savings can be realized.

A sampling of some Bay Leaves seasoning and spice blends developed by McCormick include: poultry, seafood, vegetable soup and spaghetti sauce.

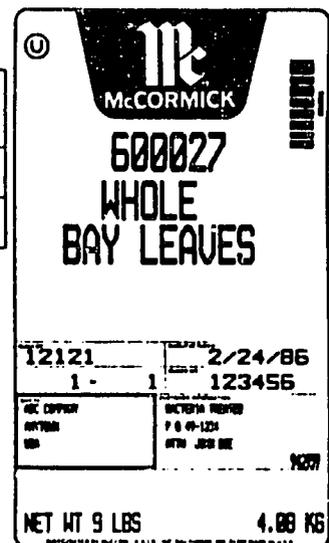
Packaging

Packaging alternatives include:

	1.88 cu. ft. boxes with polyliners	44 gal. lever pack drums with polyliners	Totes
Whole	5 lb.	40 lb.	450 lb.
Ground	25 lb.	125 lb.	600 lb.

McCormick's unique computerized labeling system prints all necessary information in a standardized, easy-to-read format which can be programmed to include customer specific data such as item codes, purchase order numbers, etc.

Note: Weights will vary depending upon product bulk density.



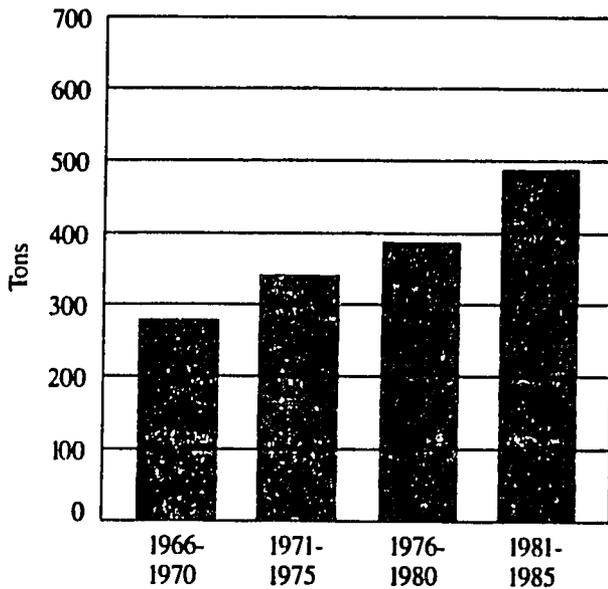
Quality Control

All McCormick spices are cleaned, bacteria treated and processed under McCormick's exacting quality control standards which meet, or in most cases exceed those specified by ASTA. Chemical and physical testing is conducted using ASTA and AOAC methods. Bay Leaves

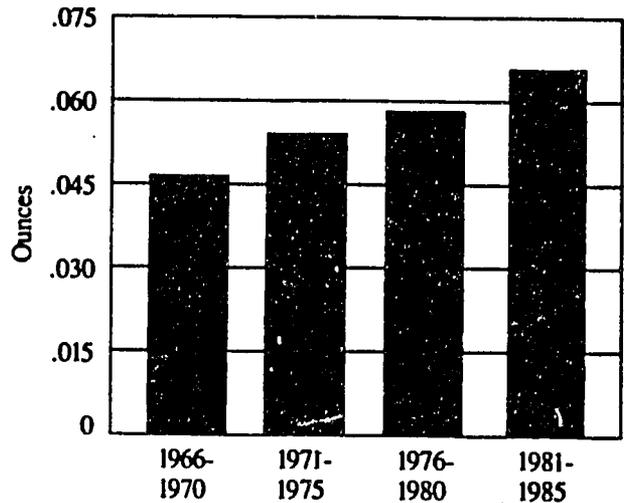
are visually inspected for overall appearance and extraneous matter. The volatile oil content, which is the principal quality factor, is determined through steam distillation methodology.

Bay Leaves Facts

Average U.S. Bay Leaves Imports

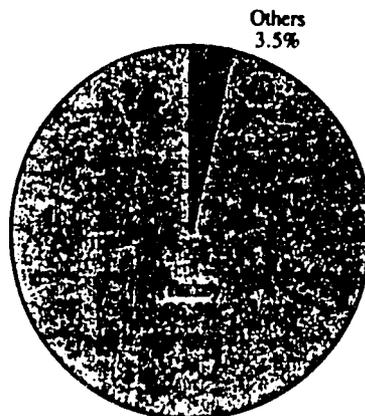


Average U.S. Per Capita Consumption (Based on U.S. Imports)



Sources: USDA, FAS Circular, FTEA Spices, Census Bureau

Percentage of U.S. Imports by Country 1981-1985



Sources: USDA, FAS Circular, FTEA Spices



McCormick Ingredients

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PRODUCT DATA

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Illustration Courtesy of: American Spice Trade Association.

BLACK PEPPER

Spice Description

Black and White Pepper are both obtained from the small dried berry of the vine *Piper nigrum*. For Black Pepper, the berries are picked while still green, allowed to ferment and are then sundried until they shrivel and turn a brownish-black color. They have a hot, piney taste.

What To Look For

The quality of Black Pepper can be assessed by:

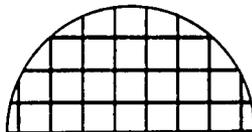
- Appearance: bold size; free from mold
- Color: uniform dark brown to black
- Flavor & Aroma: hot, biting
- Heat Level: Piperine is the major constituent

Forms And Common Usage

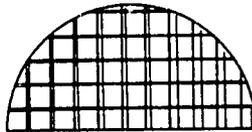


Whole

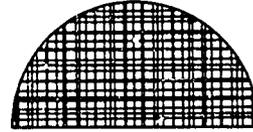
Whole peppercorns are primarily used with hand-held peppermills but are also often found in pickling mixes, marinades, soups, and sauces. Recommended usage levels range from 10 to 12 in marinade for sauerbraten, 4 pounds beef; 4 to 6 in liquid for poaching 1 to 2 pounds fish; 8 to 10 in liquid when boiling chicken, shrimp, pot roast, and variety meats such as tongue.



Cracked
Mesh Size #6



Medium Grind
Mesh Size #8



Medium Grind
Mesh Size #12

These larger grinds, such as Butcher's Grind, are especially popular in prepared meat products where a bold presentation is desired. Recommended usage levels are:

Cracked (1 t. = 3.2 g.) 1 t. to 2 t. to 1 lb. steak for peppered steak; 1/2 t. to 1 t. in 2 c. marinade for meats; 1/8 t. to each individual salad

bowl of chef's or tossed salad.

Coarse Grind (1 t. = 3.0 g.) 1/4 t. to 1/2 t. in 1 1/2 c. French or other salad dressings; 1/8 t. to 1/2 t. to 4 c. bread crumbs for stuffings; 1/8 t. to 1/4 t. sprinkled over 1 lb. steak, chops, fish, chicken or liver before broiling.

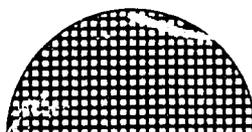
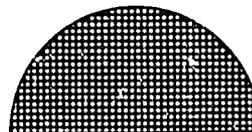
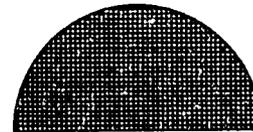


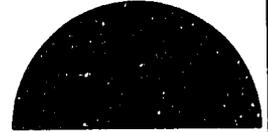
Table Grind
Mesh Size #20



Regular Grind
Mesh Size #30



Blending Grind
Mesh Size #40



Pulverized
Mesh Size #80

These grinds are used where lower visibility is desired. Recommended usage levels (1 t. = 2.9 g.) range from 1/8 t. to 1/2 t. to a 7-oz. can tuna for salad; 1/4 t. to 1/2 t. in peppernuse recipe making 6 doz. cookies.

Blending grind is commonly an ingredient to pepper seasoning blends. Pulverized pepper can be used as an extender for white pepper and frequently seasons salad dressings.

Product Description

The principal exporters for Black Pepper are India (Malabar and Tellicherry Pepper), Indonesia (Lampong Pepper), Brazil and Malaysia. Tellicherry is actually a special type of Malabar Pepper designated for its bold size

and uniform appearance. Both have excellent flavor, aroma and pungency properties. The flavor and aroma of Lampong Pepper is similar to the Malabar type. The Malaysian and Brazilian varieties are relatively milder in flavor.



Harvest/Shipment from source



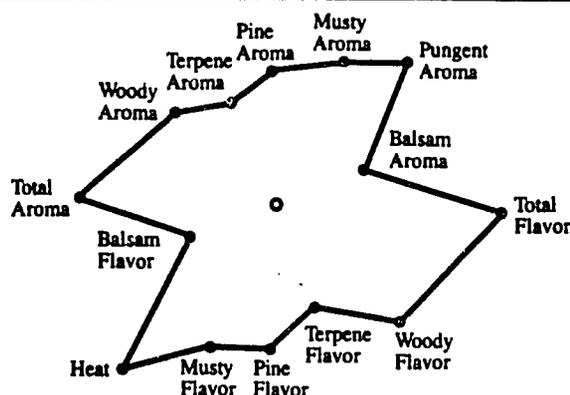
New Crop Generally Available in the United States

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
India (Malabar)	Harvest/Shipment	Harvest/Shipment	New Crop									Harvest/Shipment
Indonesia (Lampong)								Harvest/Shipment	Harvest/Shipment	New Crop		
Brazil								Harvest/Shipment	Harvest/Shipment	New Crop		
Malaysia (Sarawak)				Harvest/Shipment	Harvest/Shipment	Harvest/Shipment	New Crop					

Sensory Profile

Black Pepper has a sharp, penetrating aroma and a characteristic woody, piney flavor. It is hot and biting to taste. McCormick utilizes sensory evaluation techniques to graphically illustrate the intensity of flavor notes in Black Pepper.

For a description of the sensory evaluation methodology, please write: McCormick Ingredients
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Sample Aroma & Flavor profile for Lampong Black Pepper.
The farther from the center,
the more intense the flavor note.

Specifications

The following table is representative of major products offered; however, McCormick can and does engineer customized products to comply with exacting customer specifications:

	774330 Whole	774643 Medium Grind	774283 Table Grind	774302 Regular Grind	774284 Blending Grind	Customized Requirements
Origin	Various	Various	Various	Various	Various	Any specified source singly or in combination
Particle Size	Whole	2% max on USS #12 5% max.thru USS #40	2% max on USS #16 10% max.thru USS #30	10% max on USS #30 25% max.thru USS #100	95% min. thru USS #40	As requested
Volatile Oil (min)	1.75%	1.5%	1.5%	1.5%	1.5%	Depends on origin and grind specification
Moisture (max)	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Standard Plate Count	BT	BT	BT	BT	BT	As requested
	← Bacteria treated, no pathogens present. →					
Packaging	Box	Box	Box	Box	Box	Various

Spice Alternatives

McCormick offers all-natural alternatives for virtually all spices. The Black Pepper flavor is available in the following forms:

	Description	Code	Solubility	Remarks	Flavor Strength
Spice-Cap®	Encapsulated Spice extractive extended on a salt or dextrose carrier	F20586 (dextrose) F20797 (salt)	Water	Excellent shelf life Instant flavor release	1 Fold
Flavor-Cap®	Encapsulated Spice oils & oleoresins	F20581	Water soluble and oil dispersible	Excellent shelf life (dry) Instant flavor release in water. Available with all-natural gum arabic and modified food starch.	4 Fold
Solu-Flow®	Homogeneous, free flowing oleoresin with the complete profile of the spice	F45289 F45390	Oil Water or oil	9% min. volatile oil 20% spectro piperine 1% min. volatile oil 2% spectro piperine	9 Fold 1 Fold
Oleoresin	Solvent extracts containing complete flavor profile of the spice	F45356 F45358 F41967 (special)	Oil	20% min. volatile oil 37% spectro piperine 22% min. volatile oil 42.1% spectro piperine 18% min. volatile oil 36% spectro piperine	18 Fold 18 Fold 16 Fold

McCormick food technologists can apply spice alternatives singly or in blends to solve any taste challenge. Whichever you choose: reliable service, consistent quality,

and freedom from bacteriological concerns are positive attributes of these products.

Blends Available

Black Pepper can be added to all foods in which a spicy tang is desirable. It is frequently used in salad dressings, sausages, soups, stews and pickling mixes.

McCormick can simplify your production process by preblending products tailored to your specifications.

By calling upon our expertise, greater efficiency and opportunities for significant cost and time savings can be realized.

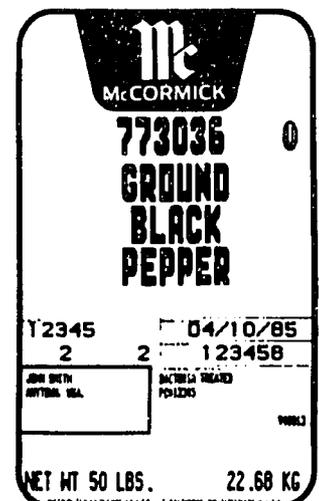
A sampling of some Black Pepper seasoning and spice blends developed by McCormick include: pizza, poultry, meat, salad dressing and gravy mixes.

Packaging

Packaging alternatives include:	1.80 cu. ft. boxes with polyliners	44 gal. lever pack drums with polyliners	Various bulk container configurations as required
Whole	50 lbs.	160-170 lbs.	1000 to 1130 lbs.
Ground	40 to 50 lbs.	160-180 lbs.	850 to 1190 lbs.

McCormick's unique computerized labelling system prints all necessary information in a standardized, easy-to-read format which can be programmed to include customer specific data such as item codes, purchase order numbers, etc.

Note: Weights will vary depending upon product bulk density.



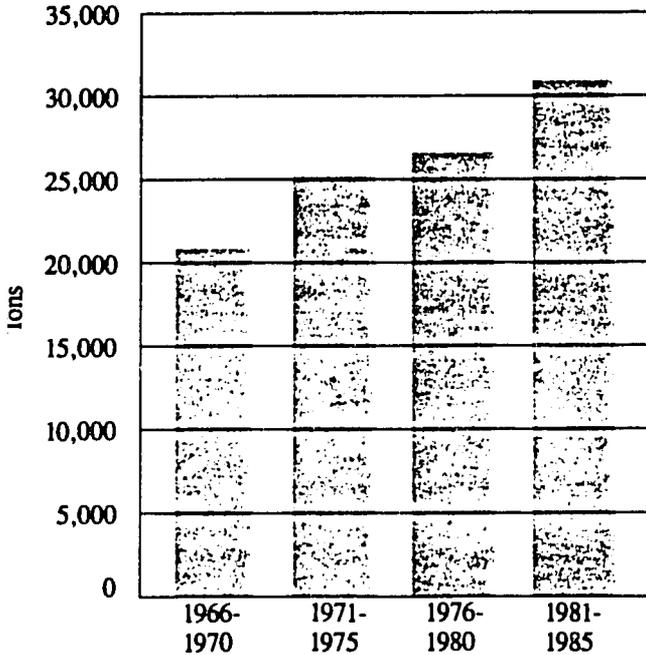
Quality Control

All McCormick spices are cleaned, bacteria treated and processed under McCormick's exacting quality control standards which meet, or in most cases exceed those specified by ASTA. Chemical and physical testing is conducted using ASTA and AOAC methods. Black Pepper

is visually inspected for overall appearance and extraneous matter. Piperine content is established through spectrophotometric procedures and volatile oil content is determined through steam distillation methodology.

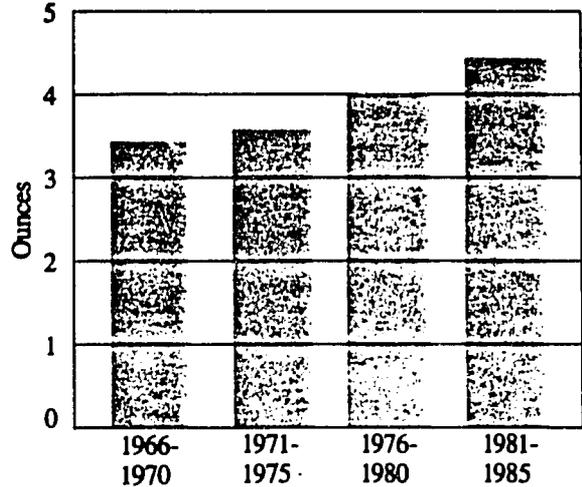
Pepper Facts

Average U.S. Black Pepper Imports



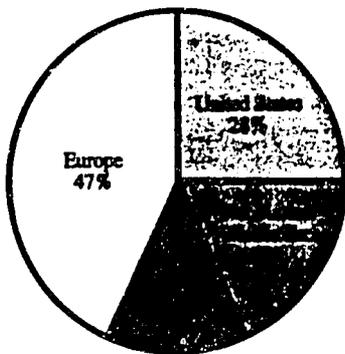
Average U.S. Per Capita Consumption

(Based on U.S. Imports)



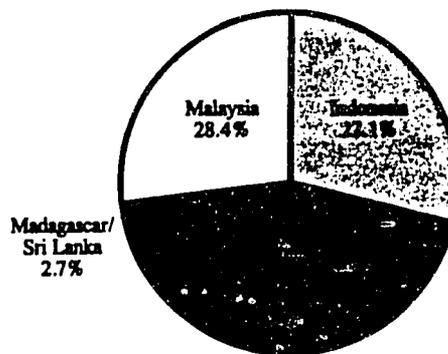
Sources: USDA, FAS Circular, FTEA Spices, Census Bureau

Where Pepper Goes



Source: Spices: A Survey of the World Market, International Trade Centre

Where Pepper Comes From



Source: FAS/USDA



McCormick Ingredients

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Hunt Valley, Maryland 21041-1307

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PRODUCT DATA

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Illustration Courtesy of: American Spice Trade Association.

CARDAMOM

Spice Description

Cardamom is the dried, unripened fruit of the perennial *Elettaria cardamomum*. Enclosed in the fruit pods are tiny brown, aromatic seeds which are slightly pungent to taste. Cardamom pods are generally green, but are also available in bleached white pod form.

What To Look For

The quality of Cardamom can be assessed by:

- Appearance: free from blemishes
- Color: bold green pods, hard brownish-black seeds
- Flavor & Aroma: aromatic and sweet
- Volatile Oil: 1, 8-Cineole being the principal contributor to the spice's flavor and aroma

Forms And Common Usage



Whole

2 to 4 to a 4-pound roast for sauerbraten. 2 to 3 in 1 quart mulled wine. 4 to 6 in 6 cups Glögg. 4 to 6 in frozen fruit ring (1- to 1½-quart mold) for punch. 6 to 8 in 2 gallons fruit punch. 2 to 4 in 2½ cups (No. 2 can) fruit for compote. 4 to 6 in 2 cups scalded milk for custards.

Ten whole Cardamom, pods removed and brown seeds crushed, equals ½ teaspoon ground Cardamom.



Ground Mesh Size #50

Suggested usage levels for various dishes:
(1 t. = 2.6 g)
Dash to ¼ teaspoon in blueberry muffin mix or recipe making 12 muffins. Dash to



Ground Mesh Size #70

¼ teaspoon in 4 cups crushed strawberries, peaches or raspberries. ¼ teaspoon to ½ teaspoon to 8 egg whites for meringue shells or floating island meringues. ¼ teaspoon to

¼ teaspoon in 2-layer cake recipe or cake mix. Dash in 2 cups baked beans. Dash in 1 cup coconut, toasted. ¼ teaspoon to ½ teaspoon to 2 cups sweet potatoes.

Product Description

Cardamom is distinguished by its physical form and origin. It is available both in the whole pod and as decorticated seeds with the outer hull removed. Two varieties are indigenous to India but are also cultivated in Guatemala and Sri Lanka. Indian Cardamom is considered to be of premium quality. The Malabar (Indian) variety, rounded in shape, has a pleasantly mellow flavor generally regarded as

superior. The Mysore (Indian) variety, which is ribbed and three cornered, has a slightly harsher flavor but retains its green color longer. Guatemalan Cardamom, which comprises the majority of imports into the United States, compares favorably with that of Indian origin. Sri Lankan Cardamom is noted for its good color.



Harvest/Shipment
from Source



New Crop Generally Available
in the United States

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
India												
Guatemala												
Sri Lanka												

Sensory Profile

Cardamom has a citrus-like, floral, soapy flavor containing some green/woody notes. It has a menthol undertone and is similar to Ginger. McCormick utilizes sensory evaluation techniques to graphically illustrate the intensity of flavor notes in Cardamom. The sensory profile of Cardamom was being revised at the time of publication.

For a description of the sensory evaluation methodology, please write: McCormick Ingredients

10901 Gilroy Road
Hunt Valley, Maryland 21031-1307

Specifications

The following table is representative of major products offered; however, McCormick can and does engineer customized products to comply with exacting customer specifications:

	600038 Whole	774253 Ground	773311 Ground
Origin	Various	Various	Various
Particle Size	Whole	85% min. thru USS #50	45% max. on USS #70 30% min. thru USS #100
Volatile Oil (min.)	3.0%	2.0%	3.0%
Moisture (max.)	12.0%	12.0%	12.0%
Standard Plate Count	10,000	Bacteria treated	10,000
Packaging	Various	Box	Various

Spice Alternatives

McCormick offers all-natural alternatives for virtually all spices. The Cardamom flavor is available in the following forms:

	Description	Code	Solubility	Remarks	Flavor Strength
Spice Cap®	Encapsulated Spice extractive extended on a salt or dextrose carrier	F30066 (dextrose) F21751 (salt)	Water	Excellent shelf life Instant flavor release	1 Fold
Flavor Cap®	Encapsulated Spice oils and oleoresins	F30006	Water soluble and oil dispersible	Excellent shelf life (dry) Instant flavor release in water available	20 Fold
Solu-Flow®	Liquid containing natural flavor and emulsifier	F45172	Complete solubility in water or oil	Instant flavor release Water solubility with clarity	2-3 Fold

McCormick food technologists can apply spice alternatives singly or in blends to solve any taste challenge. Whichever you choose: reliable service, consistent quality,

and freedom from bacteriological concerns are positive attributes of these products.

Blends Available

Cardamom is a principal seasoning in Danish pastries. It improves both sweet and savory dishes and is excellent in pickling mixtures, baked goods, sweet potatoes, fruit dishes and squash.

McCormick can simplify your production process by preblending products tailored to your specifications.

By calling upon our expertise, greater efficiency and opportunities for significant cost and time savings can be realized.

A sampling of some Cardamom seasoning and spice blends developed by McCormick includes: seafood, braunsweiger, curry, spice cake and cookie.

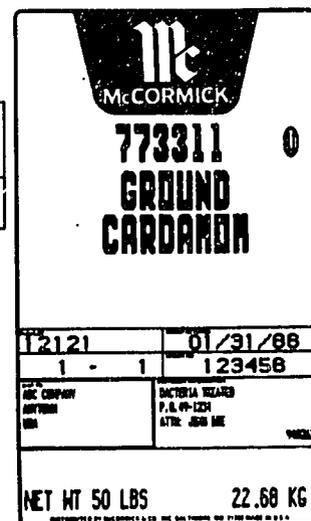
Packaging

Packaging alternatives include:

	1.88 cu. ft. boxes with polyliners	44 gal. lever pack drums with polyliners	Totes
Ground	50 lb.	180 lb.	600 lb.

McCormick's unique computerized labelling system prints all necessary information in a standardized, easy-to-read format which can be programmed to include customer-specific data such as item codes, purchase order numbers, etc.

Note: Weights will vary depending upon product bulk density.



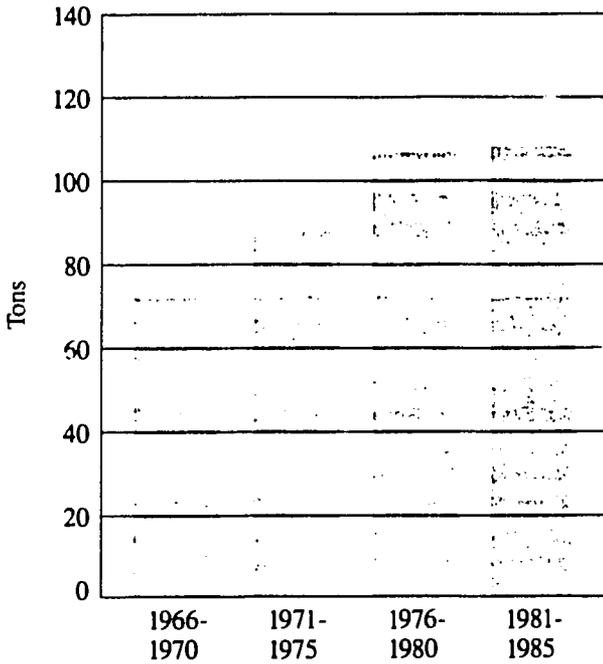
Quality Control

All McCormick spices are cleaned, bacteria treated and processed under McCormick's exacting quality control standards which meet, or in most cases exceed, those specified by ASTA. Chemical and physical testing is conducted using ASTA and AOAC methods. Cardamom is

visually inspected for overall appearance and extraneous matter. The volatile oil content, which is the principal quality factor, is determined through steam distillation methodology.

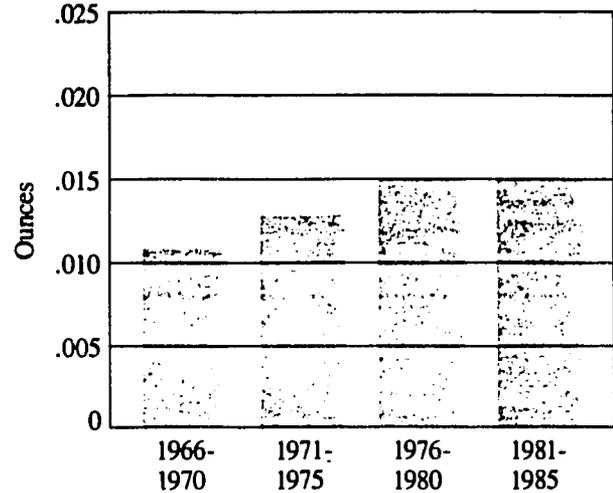
Cardamom Facts

Average U.S. Cardamom Imports



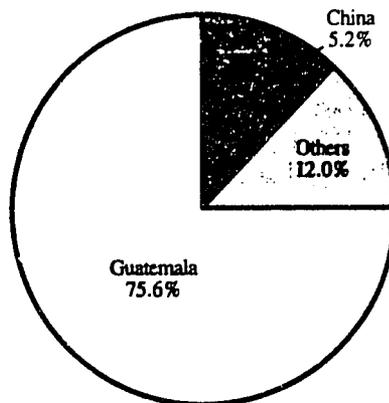
Average U.S. Per Capita Consumption

(Based on U.S. Imports)



Sources: USDA, FAS Circular, FTEA Spices, Census Bureau

Percentage of U.S. Imports by Country 1981-1985



Sources: USDA, FAS Circular, FTEA Spices



McCormick Ingredients

10901 Gilroy Road
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suggestions are made without warranty of any kind, either expressed or implied. Purchasers are urged to make their own tests and investigations to determine the effectiveness of the products in their processes, in their products, and to prevent any possible patent liability arising out of such use



PRODUCT DATA

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Illustration Courtesy of: American Spice Trade Association.

GINGER

Spice Description

Ginger is the dried, hand-shaped root of the herb *Zingiber officinale*. Externally it is a pale yellow color but internally it is buff colored. Ginger is noted for its pungent flavor.

What To Look For

The quality of Ginger can be assessed by:

- Appearance: mold-free
- Flavor & Aroma: pungent and aromatic
- Pungency Level: Gingerols are the principal constituents

Forms And Common Usage



Whole

Whole Ginger is used in pickling, syrups, beverages, marinades, stewed fruit, teriyaki sauce, preserves, tea and ginger beer.



Ground

Mesh Size #50

Suggested usage levels for various dishes: (1 t. = 1.9 g.) ¼ teaspoon to 2 teaspoons for 1 ½ pounds pork. Dash to ¼ teaspoon to 2 cups sliced carrots. ¼ teaspoon to 3 cups mixed fruit. ¼ teaspoon to 1 cup of coconut, toasted. ¼ teaspoon to

1 teaspoon in 2 cups sweet potatoes. Dash to ¼ teaspoon in bread puddings and rice puddings yielding 4 to 6 servings. 1 teaspoon to 1 ½ teaspoons in cookie recipe (2 cups flour). ¼ teaspoon to ¼ teaspoon to 2 egg whites for meringues.

Ground Ginger may be used in many recipes in place of whole Ginger—1 teaspoon ground Ginger may be substituted for 10 to 12 pieces whole Ginger about the size of shelled peanuts.

Product Description

Although Jamaican Ginger is considered superior due to its appearance, flavor and aroma, the principal exporters are India and China. Indian (Cochin) Ginger, which is

nearly as pungent as the Jamaican, has a characteristically lemony flavor and aroma.



Harvest/shipment from Source



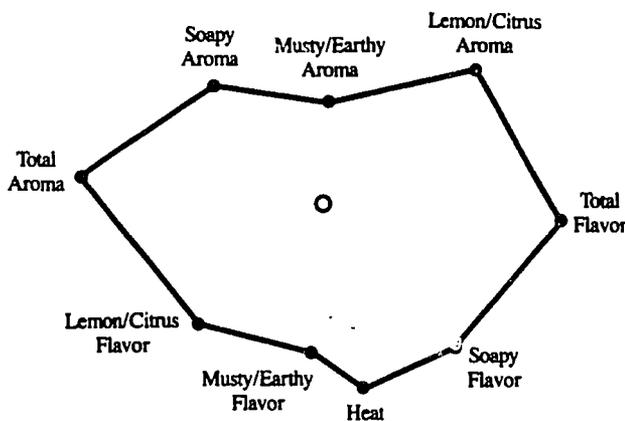
New Crop Generally Available in the United States

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
India	Harvest	Harvest	Harvest	Harvest	New Crop							
China	Harvest	Harvest	New Crop									
Jamaica	Harvest	Harvest	Harvest	New Crop								

Sensory Profile

The flavor of Ginger is characterized by its unique combination of lemon/citrus, soapy and musty/earthy flavor notes. It is warming to taste. McCormick utilizes sensory evaluation techniques to graphically illustrate the intensity of flavor notes in Ginger.

For a description of the sensory evaluation methodology, please write: McCormick Ingredients
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Hunt Valley, Maryland 21031-1307



The farther from the center, the more intense the flavor note.

Specifications

The following table is representative of major products offered; however, McCormick can and does engineer customized products to comply with exacting customer specifications:

	774272 Ground	773391 Ground	774233 Ground
Origin	Various	Cochin	China
Particle Size	85% min. thru USS #50	5% max. on USS #50 90% min. thru USS #60	5% max on USS #50 90% min. thru USS #60
Volatile Oil	1.5%	1.5%	1.5%
Moisture (max.)	12.0%	12.0%	12.0%
Standard Plate Count	Bacteria Treated	50,000	100,000
Packaging	Box	Various	Various

Flavor-Max Ginger. McCormick also offers a special ground Ginger with reduced lipase activity and a higher impact/aroma. This product is especially useful in fat-based applications where an extended shelf life is desirable.

Spice Alternatives

McCormick offers all-natural alternatives for virtually all spices. The Ginger flavor is available in the following forms:

	Description	Code	Solubility	Remarks	Flavor Strength
Spice Cap®	Encapsulated Spice extractive extended on a salt or dextrose carrier	F30074 (dextrose) F20983 (salt)	Water	Excellent shelf life Instant flavor release	1 Fold
Flavor Cap®	Encapsulated Spice oils and oleoresins	F30014	Water soluble and oil dispersible	Excellent shelf life (dry) Instant flavor release in water available	5 Fold
Solu-Flow®	Liquid containing natural flavor and emulsifier	F45136	Complete solubility in water or oil	Instant flavor release Water solubility with clarity	2-3 Fold
Oleoresin	Concentrated extracts containing complete flavor profile of the spice	F45023	Oil	30% min. volatile oil	30 Fold

McCormick food technologists can apply spice alternatives singly or in blends to solve any taste challenge. Whichever you choose: reliable service, consistent quality,

and freedom from bacteriological concerns are positive attributes of these products.

Blends Available

Ginger, one of the most versatile spices, is excellent in combination with other spices. It is known best for its use in gingerbread, ginger snaps and other baked goods. Ginger is an important ingredient in Hawaiian-type dishes and is often used in marinades, meats, soups, Oriental delicacies, and fruit preparations.

McCormick can simplify your production process by

preblending products tailored to your specifications. By calling upon our expertise, greater efficiency and opportunities for significant cost and time savings can be realized.

A sampling of some Ginger seasoning and spice blends developed by McCormick include: gingerbread, roast beef sauce, poultry, curry and Oriental.

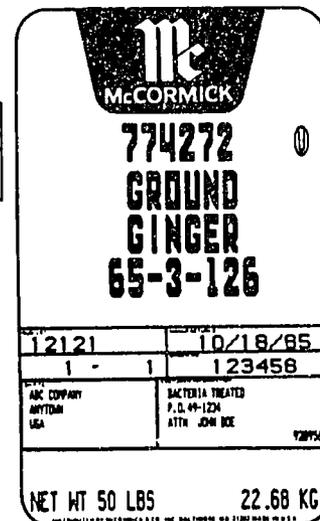
Packaging

Packaging alternatives include:

	Boxes	Lever Pack	Totes
Ground	50 lb.	200 lb.	1000 lb.

McCormick's unique computerized labelling system prints all necessary information in a standardized, easy-to-read format which can be programmed to include customer-specific data such as item codes, purchase order numbers, etc.

Note: Weights will vary depending upon product bulk density.



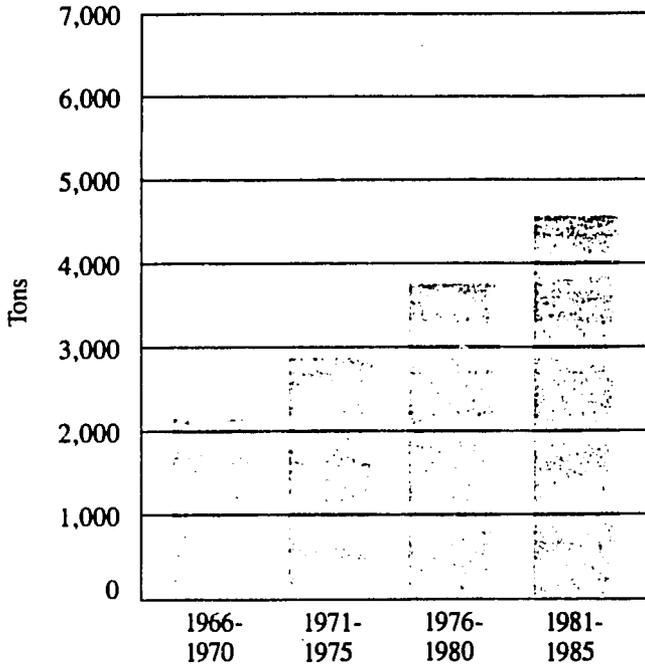
Quality Control

All McCormick spices are cleaned, bacteria treated and processed under McCormick's exacting quality control standards which meet, or in most cases exceed, those specified by ASTA. Chemical and physical testing is con-

ducted using ASTA and AOAC methods. Ginger is visually inspected for overall appearance and extraneous matter. The volatile oil content is determined through steam distillation methodology.

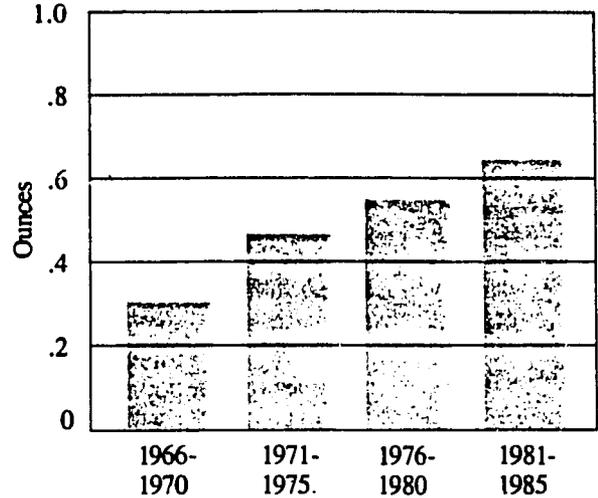
Ginger Facts

Average U.S. Ginger Imports



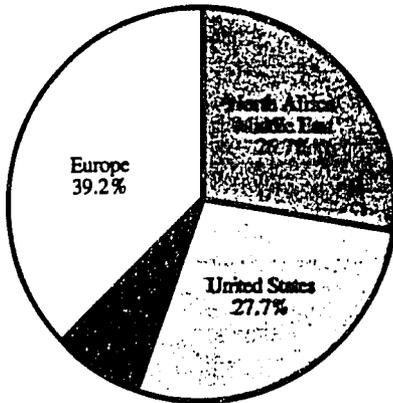
Average U.S. Per Capita Consumption

(Based on U.S. Imports)

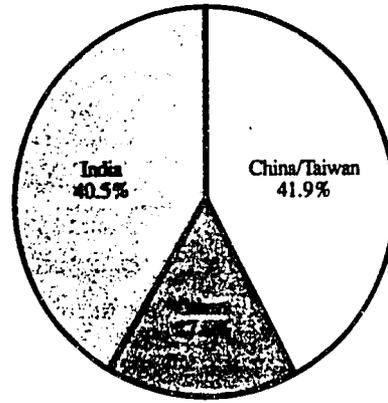


Sources: USDA, FAS Circular, FTEA Spices, Census Bureau

Where Ginger Goes



Where Ginger Comes From



Source: Spices: A Survey of the World Market, International Trade Centre

Source: FAS/USDA



McCormick Ingredients

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PRODUCT DATA

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Illustration Courtesy of: American Spice Trade Association.

OREGANO

Spice Description

Oregano is the dried leaves of the herbs *Origanum spp* or *Lippia spp* (Mexican). "Oregano" means Marjoram in Spanish, and although it is sometimes referred to as "Wild Marjoram," it is a different herb.

What To Look For

The quality of Oregano can be assessed by:

- Appearance: leaf size, minimal foreign matter
- Color: light to dark green
- Flavor & Aroma: strongly aromatic, slightly bitter
- Volatile Oil: Carvacrol being the principal contributor to the spice's flavor and aroma

Forms And Common Usage



Whole

Oregano goes well with tomatoes and is a natural seasoning with any tomato dish. Use to season pasta sauces, tomato juice, pizza, chili con carne, barbecue sauce and vegetable soup. It is excellent in egg and cheese dishes, onions, seafood salads, stuffings for meat or poultry, sauce for fish, and on pork, lamb, chicken and fish.



Ground

Mesh Size #50

Suggested usage levels for various dishes:
Whole (leaves)
(1 t. = 1.2 g)
¼ teaspoon to ¾ teaspoon to 4 eggs for egg salad. ¼ teaspoon to ½ teaspoon in ½ cup butter for baked potatoes, bread or basting fish. ¼ teaspoon to ½ teaspoon in 2 cups

spinach, green beans or 3 cups tomatoes. 1 teaspoon to 3 cups flour in making yeast bread. 1 teaspoon sprinkled on 12- to 14-inch pizza. ½ teaspoon to ¼ teaspoon in 2 cups tomato, spaghetti or barbecue sauce (ground Oregano may also be used).

Ground
(1 t. = 2.3 g)
¼ teaspoon to ¾ teaspoon in 1 pound ground beef. ¼ teaspoon to ½ teaspoon for 1 pound pork.

Product Description

Turkey is the principal supplier of Oregano to McCormick. It is stronger flavored and more bitter than the Greek variety. The Mexican type has a

distinctively different flavor which is less minty, more hay-like and less bitter than the other sources.

 Harvest/Shipment from Source

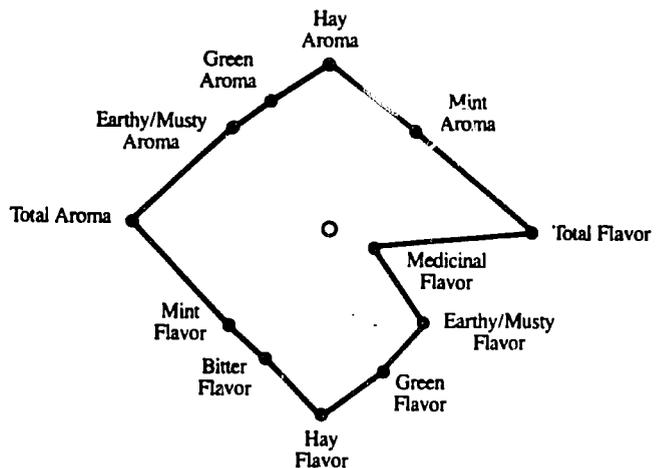
 New Crop Generally Available in the United States

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Turkey												
Greece												
Israel												
Mexico												

Sensory Profile

Oregano is generally described as possessing a strongly aromatic, camphoraceous aroma and a slightly bitter, pungent flavor. This pungent flavor is composed of earthy/musty, green, hay and minty notes. The spice imparts a slightly astringent mouthfeel. McCormick utilizes sensory evaluation techniques to graphically illustrate the intensity of flavor notes in Oregano.

For a description of the sensory evaluation methodology, please write: McCormick Ingredients
10901 Gilroy Road
Hunt Valley, Maryland 21031-1307



The farther from the center, the more intense the flavor note.

Specifications

The following table is representative of major products offered; however, McCormick can and does engineer customized products to comply with exacting customer specifications:

	774277 Whole	774279 Whole	774280 Ground	Customized Requirements
Origin	Mexico	Mediterranean	Mediterranean	Any specified source singly or in combination
Particle Size	Whole	Whole	90% min. on USS #50	As requested
Volatile Oil (min.)	2.5%	2.0%	2.0%	Depends on origin & grind specifications
Moisture (max.)	12.0%	12.0%	12.0%	12.0%
Standard Plate Count	Bacteria treated	Bacteria treated	Bacteria treated	10,000
Packaging	Box	Box	Box	Various

Spice Alternatives

McCormick offers all-natural alternatives for virtually all spices. The Oregano flavor is available in the following forms:

	Description	Code	Solubility	Remarks	Flavor Strength
Spice Cap®	Encapsulated Spice extractive extended on a salt or dextrose carrier	F30078 (dextrose) F20810 (salt)	Water	Excellent shelf life Instant flavor release	1 Fold
Flavor Cap®	Encapsulated Spice oils and oleoresins	F30018	Water soluble and oil dispersible	Excellent shelf life (dry) Instant flavor release in water available	10 Fold
Solu-Flow®	Liquid containing natural flavor and emulsifier	F45308	Complete solubility in water or oil	Instant flavor release Water solubility with clarity	2-3 Fold
Oleoresin	Concentrated extracts containing complete flavor profile of the spice	F45027	Oil	15% min. volatile oil	45 Fold

McCormick food technologists can apply spice alternatives singly or in blends to solve any taste challenge. Whichever you choose: reliable service, consistent quality,

and freedom from bacteriological concerns are positive attributes of these products.

Blends Available

Oregano is popular as a flavoring for tomato dishes and Italian specialties. It is an essential ingredient of chili powder. Oregano is also used in many Mexican dishes such as chili, bean dishes and spicy soups.

McCormick can simplify your production process by preblending products tailored to your specifications.

By calling upon our expertise, greater efficiency and opportunities for significant cost and time savings can be realized.

A sampling of some Oregano seasoning and spice blends developed by McCormick includes: spaghetti sauce, pizza, pepperoni, taco and chili powder.

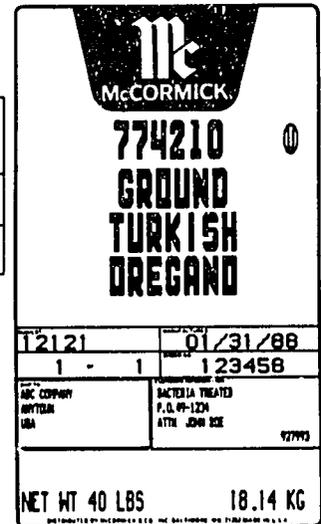
Packaging

Packaging alternatives include:

Packaging alternatives include:	1.88 cu. ft. boxes with polyliners	44 gal. lever pack drums with polyliners	Totes
Whole	15 lb.	50 lb.	400 lb.
Ground	30 lb.	125 lb.	800 lb.

McCormick's unique computerized labelling system prints all necessary information in a standardized, easy-to-read format which can be programmed to include customer-specific data such as item codes, purchase order numbers, etc.

Note: Weights will vary depending upon product bulk density.



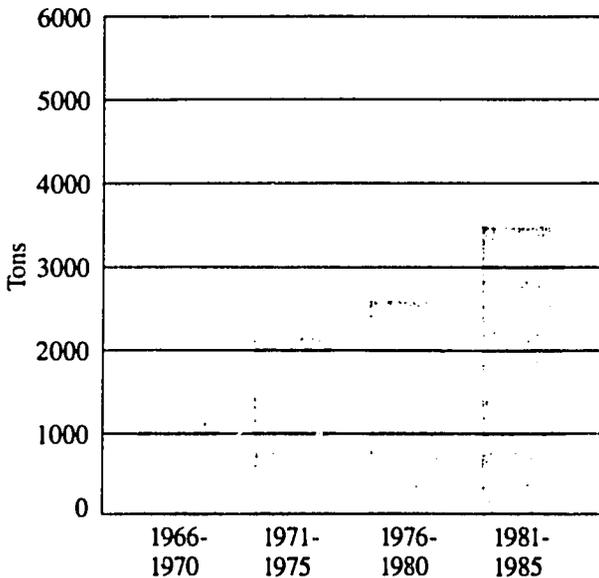
Quality Control

All McCormick spices are cleaned, bacteria treated and processed under McCormick's exacting quality control standards which meet, or in most cases exceed, those specified by ASTA. Chemical and physical testing is conducted using ASTA and AOAC methods. Oregano is

visually inspected for overall appearance and leaf size. The volatile oil content, which is the principal quality factor, is determined through steam distillation methodology.

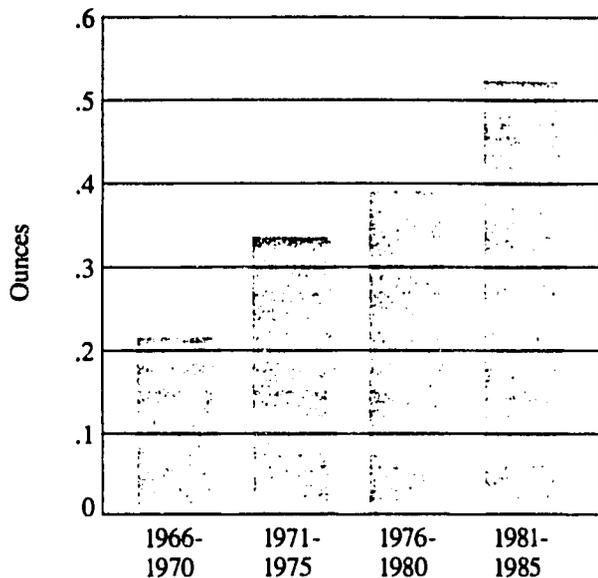
Oregano Facts

Average U.S. Oregano Imports



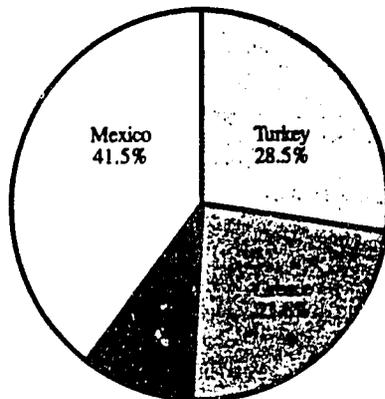
Average U.S. Per Capita Consumption

(Based on U.S. Imports)



Sources: USDA, FAS Circular, FTEA Spices, Census Bureau

Percentage of U.S. Imports by Country 1981-1985



Source: USDA, FAS Circular, FTEA Spices



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PRODUCT DATA

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Illustration Courtesy of: American Spice Trade Association.

RED PEPPER

Spice Description

Red Pepper is the dried, ripened fruit pod of *Capsicum frutescens*, one of the most pungent Capsicums. Historically, it was called Cayenne to denote an extremely hot flavor. This distinction has faded since no specified standard of heat is actually defined by this term.

What To Look For

The quality of Red Pepper can be assessed by:

- Color: orange-red to deep red; Capsanthin is the principal constituent
- Heat Level: Capsaicin is the major constituent

Forms And Common Usage



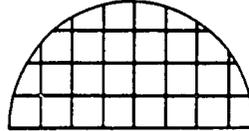
Whole

Red Pepper is frequently used to add zest to many Italian and Mexican dishes. It may also be used to season meats, seafood, deviled eggs, appetizers, soups and chowders, tomato aspic, cottage and cream cheese, cheese dishes, sauces, gravy, salad dressing, pickles, poultry, game, vegetables, spaghetti sauce, tamales, curried dishes, creamed dishes, ceviche, cheese straws or wafers, dips, spreads for canapés, sauces for seafood appetizers, tomato juice cocktail, Bloody Marys, omelettes, soufflés, croquettes, tamale pie, guacamole, barbecued beef and pork.



Crushed

Crushed Red Pepper is particularly important in pickling, chowders, gumbos, spaghetti sauce, pizza sauce and in making sausage.



Crushed
Mesh Size #6

Suggested usage levels for various dishes:
(1 t. = 2.0 g.) ground;

Dash to ¼ teaspoon to 1 pound shrimp.

Dash to ½ teaspoon to 6 eggs — stuffed, scrambled or for omelettes.

Dash to ½ teaspoon in ½ cup butter for basting chicken or fish or to use over vegetables.

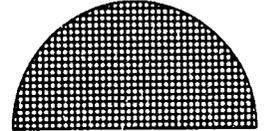
Suggested usage levels for various dishes:
(1 t. = 1.8 g.) crushed;

½ teaspoon to 1 teaspoon to 1 pound ground beef.

½ teaspoon to ¼ teaspoon in 2 cups pizza or spaghetti sauce.

1 teaspoon to 2 teaspoons to 4 pints tomato relish, mixed pickles or dilled green beans.

A good rule to follow is to use a dash to ½ teaspoon in most recipes for 4 servings unless extremely hot food is desired. Increase to suit individual taste.



Ground
Mesh Size #30

Product Description

Although there are numerous sources of Red Pepper, India, Pakistan, and China are the major producers.

Varieties originating from these countries are among the hottest and most pungent types.



Harvest/Shipments from Source



New Crop Generally Available in the United States

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
India	Harvest	Harvest	Harvest		New Crop				Harvest	Harvest	Harvest	Harvest
Pakistan									Harvest	Harvest		New Crop
China			New Crop							Harvest	Harvest	Harvest

Sensory Profile

Red Pepper is noted for its hot, sharp pungency. The heat is both a throat and a mouth heat. Its musty flavor combines with floral, spicy and hay-like notes to give Red Pepper its characteristic flavor profile. McCormick utilizes sensory evaluation techniques to graphically illustrate the intensity of flavor notes in Red Pepper. The sensory profile of Red Pepper was being revised at the time of publication.

For a description of the sensory evaluation methodology, please write: McCormick Ingredients
10901 Gilroy Road
Hunt Valley, Maryland 21031-1307

Specifications

The following table is representative of major products offered; however, McCormick can and does engineer customized products to comply with exacting customer specifications:

	774258 Crushed	774524 Ground	760353 Crushed	772291 Ground
Origin	Various	Various	China/India	China/India
Particle Size	5% max. on USS #6 10% max. thru USS #20	95% min. thru USS #30	1% max. on USS #6 10% max. thru USS #20	2% max. on USS #30 30% max. thru USS #100
Sensory Heat (min.)	20,000- 40,000	20,000- 40,000	25,000- 50,000	30,000- 50,000
Moisture (max.)	12.0%	12.0%	12.0%	12.0%
Standard Plate Count	Bacteria Treated	Bacteria Treated	Bacteria Treated	10,000
Packaging	Box	Box	Box	Various

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Spice Alternatives

McCormick offers all-natural alternatives for virtually all spices. The Red Pepper flavor is available in the following forms:

	Description	Code	Solubility	Remarks	Flavor Strength
Flavor Cap®	Encapsulated Spice oils and oleoresins	F21518	Water soluble and oil dispersible	Excellent shelf life (dry) Instant flavor release in water available	140,000 analytical heat value
Solu-Flow®	Liquid containing natural flavor and emulsifier	F46887 F43516	Complete solubility in water or oil	Instant flavor release Water solubility with clarity	40,000 analytical heat value 325,000 analytical heat value
Oleoresin	Concentrated extracts containing complete flavor profile of the spice	F45357 F45330	Oil	N/A	250,000 analytical heat value 500,000 analytical heat value

McCormick food technologists can apply spice alternatives singly or in blends to solve any taste challenge. Whichever you choose: reliable service, consistent quality,

and freedom from bacteriological concerns are positive attributes of these products.

Blends Available

Red Pepper is widely used in Mexican and Italian dishes. It is often found in sausages, spaghetti sauce, pickling mixes, meats, cheese dishes and spreads.

McCormick can simplify your production process by preblending products tailored to your specifications. By calling upon our expertise, greater efficiency and

opportunities for significant cost and time savings can be realized.

A sampling of some Red Pepper seasoning and spice blends developed by McCormick include: barbecue, spaghetti, taco, seafood and curry sauce.

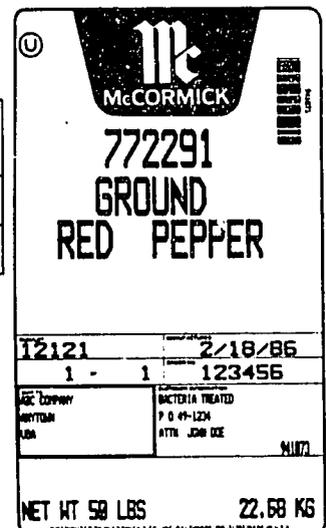
Packaging

Packaging alternatives include:

Packaging alternatives include:	1.88 cu. ft. boxes with polyliners	44 gal. lever pack drums with polyliners	Totes
Crushed	25 lb.	140 lb.	900 lb.
Ground	50 lb.	160 lb.	1000 lb.

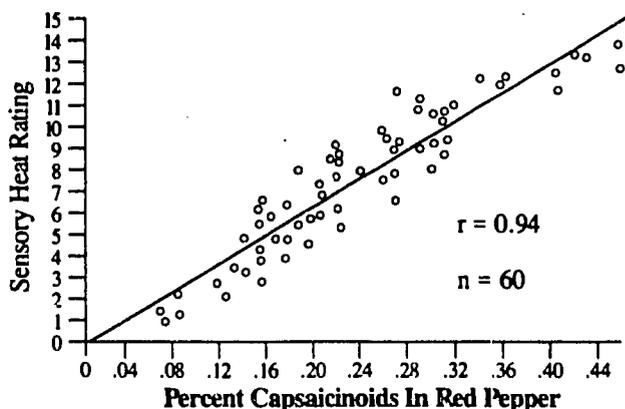
McCormick's unique computerized labeling system prints all necessary information in a standardized, easy-to-read format which can be programmed to include customer specific data such as item codes, purchase order numbers, etc.

Note: Weights will vary depending upon product bulk density.



Quality Control

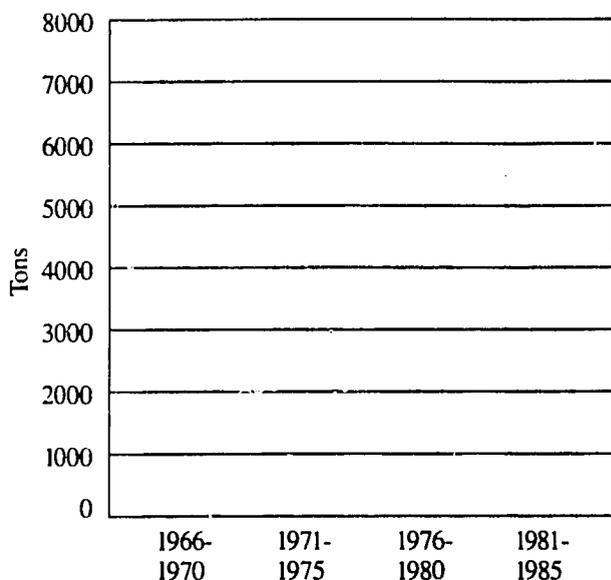
All McCormick spices are cleaned, bacteria treated and processed under McCormick's exacting quality control standards which meet, or in most cases exceed those specified by ASTA. Chemical and physical testing is conducted using ASTA and AOAC methods. The sensory heat level of Red Pepper, which is the principal quality factor, is predicted using the linear relationship between sensory heat and level of capsaicinoids (determined by high pressure liquid chromatography).



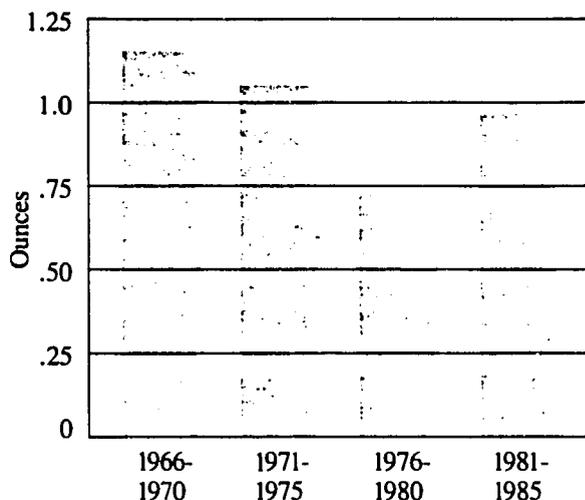
Linear relationship between sensory heat rating and percent capsaicinoids in ground Red Pepper.

Red Pepper Facts

Average U.S. Red Pepper Imports

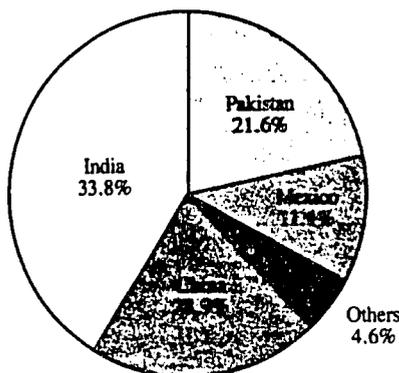


Average U.S. Per Capita Consumption (Based on U.S. Imports)



Sources: USDA, FAS Circular, FTEA Spices, Census Bureau

Percentage of U.S. Imports by Country 1981-1985



Sources: USDA, FAS Circular, FTEA Spices



McCormick Ingredients

10901 Guilford Road
Hurst Valley, Maryland 21051-1307

The information contained herein and/or as indicated on samples submitted is based on laboratory work and is, to the best of our knowledge, true and accurate. However, since the exact conditions under which this information or our products may be used are beyond our control, any recommendations or suggestions are

made without warranty of any kind, either expressed or implied. Purchasers are urged to make their own tests and investigations to determine the effectiveness of the products in their processes, in their products, and to prevent any possible patent liability arising out of such use.

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PRODUCT DATA

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Illustration Courtesy of: American Spice Trade Association.

TURMERIC

Spice Description

Tumeric is the dried root of the plant *Curcuma longa*. Noted for its bright yellow color, it is related to and similar in size to Ginger. Tumeric's flavor is woody and musty.

What To Look For

The quality of Turmeric can be assessed by:

- Appearance: length and thickness
- Color: Curcumin content of the pigments being the principal constituent
- Flavor & Aroma: earthy, pungent

Forms And Common Usage



Whole

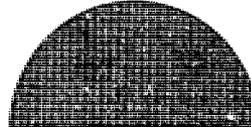
Turmeric is a major ingredient in curry powder and prepared mustard. It may be used in egg dishes, pickles, chow-chow, rice dishes, cream sauces, salad dressings, breads, relish, mayonnaise, soups, noodles, and in preparing chicken or fish.



Ground

Mesh Size #50

Suggested usage levels for various dishes:
(1 t. = 2.5g.) Dash to 1/8 teaspoon in 6 stuffed or scrambled eggs. Dash to 1/4 teaspoon for 1 cup uncooked rice or 8-ounce



Ground

Mesh Size #50

package noodles. Dash to 1/4 teaspoon in 2 cups white sauce or cheese sauce. 1/8 teaspoon to 1/4 teaspoon in 1/2 cup butter for basting chicken and sea food when broiling or baking. 1/4

teaspoon to 1/2 teaspoon in 1 cup mayonnaise or commercial sour cream for dressing or dunk for shrimp, lobster, or other sea food.

Product Description

India (Alleppey Turmeric) is the primary exporter, although Peru and China are additional sources. Alleppey Turmeric is highly regarded for its deep yellow to

orange-yellow color. Chinese Turmeric which is of comparable quality to Alleppey, is characteristically more brownish colored.



Harvest/Shipment from Source



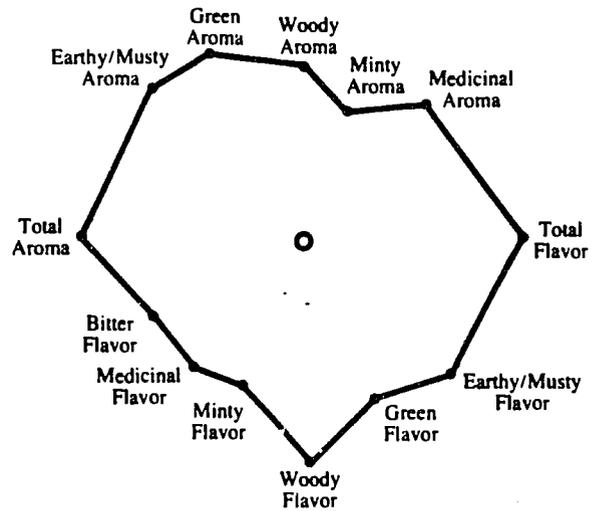
New Crop Generally Available in the United States

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
India												
Peru												
China												
Costa Rica												

Sensory Profile

Turmeric has a characteristic musky, earthy aroma and a pungent, slightly bitter flavor. McCormick utilizes sensory evaluation techniques to graphically illustrate the intensity of flavor notes in Turmeric.

For a description of the sensory evaluation methodology, please write: McCormick Ingredients
10901 Gilroy Road
Hunt Valley, Maryland 21031-1307



The farther from the center, the more intense the flavor note.

Specifications

The following table is representative of major products offered; however, McCormick can and does engineer customized products to comply with exacting customer specifications:

	774294 Ground	773330 Ground	760535 Ground
Origin	Various	Alleppey	Alleppey
Particle Size	90% min. thru USS #50	10% max. on USS #50 25% max. thru USS #230	98% min. thru USS #60
Volatile Oil (min.)	N/A	3.5%	4.0%
Moisture (max.)	12.0%	9.0%	11.5%
Curcumin Content	3.0% min.	5.0-6.6%	5.0-6.6%
Standard Plate Count (max.)	Bacteria Treated	75,000	75,000
Packaging	Box	Various	Various

Spice Alternatives

McCormick offers all-natural alternatives for virtually all spices. The Turmeric flavor is available in the following forms:

	Description	Code	Solubility	Remarks
Flavor Cap®	Encapsulated Spice oils and oleoresins	F21126	Water soluble and oil dispersible	Excellent shelf life (dry) Instant flavor release in water available
Solu-Flow®	Liquid containing natural flavor and emulsifier	F44584 Debittered	Complete solubility in water or oil	Instant flavor release Water solubility with clarity
Oleoresin	Concentrated extracts containing complete flavor profile of the spice	F30173	Oil	8.5% Curcumin content

McCormick food technologists can apply spice alternatives singly or in blends to solve any taste challenge. Whichever you choose: reliable service,

consistent quality, and freedom from bacteriological concerns are positive attributes of these products.

Blends Available

Turmeric is an important ingredient in curry powder and is used in the preparation of egg dishes, pickles, chow-chow, cream sauces and radishes. It is often combined with mustard in flavoring sauces.

McCormick can simplify your production process by preblending products tailored to your specifications. By calling upon our expertise, greater efficiency and

opportunities for significant cost and time savings can be realized.

A sampling of some Turmeric seasoning and spice blends developed by McCormick include: curry sauce, chicken soup, Mexican barbecue, pilaf and Oriental.

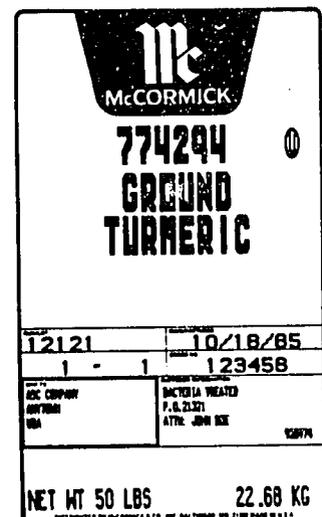
Packaging

Packaging alternatives include:

	1.88 cu. ft. boxes with polyliners	44 gal. lever pack drums with polyliners	Totes
Ground	50 lb.	170 lb.	1000 lb.

McCormick's unique computerized labelling system prints all necessary information in a standardized, easy-to-read format which can be programmed to include customer specific data such as item codes, purchase order numbers, etc.

Note: Weights will vary depending upon product bulk density.



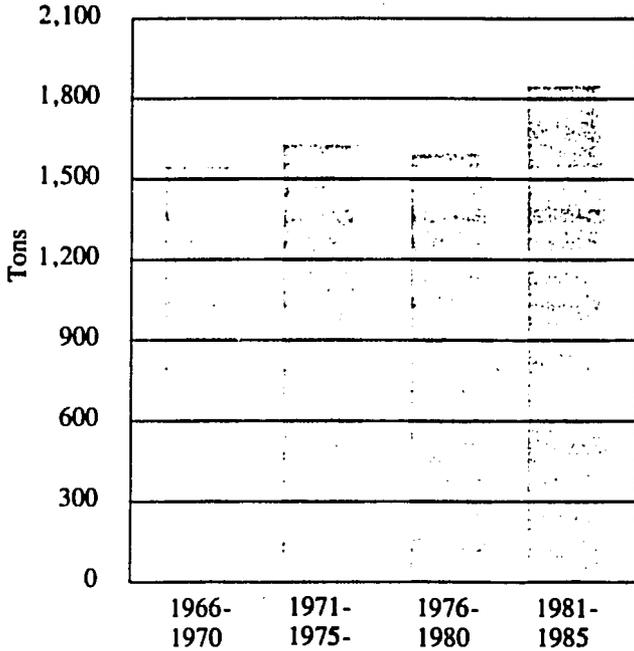
Quality Control

All McCormick spices are cleaned, bacteria treated and processed under McCormick's exacting quality control standards which meet, or in most cases exceed, those specified by ASTA. Chemical and physical testing is conducted using ASTA and AOAC methods. Turmeric

is visually inspected for overall appearance and color. Curcumin content is examined through spectrophotometric procedures and volatile oil content is determined through steam distillation methodology.

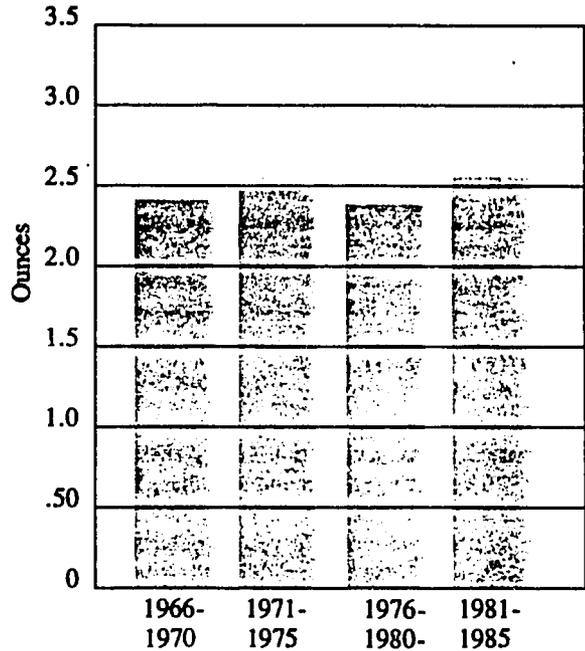
Turmeric Facts

Average U.S. Turmeric Imports



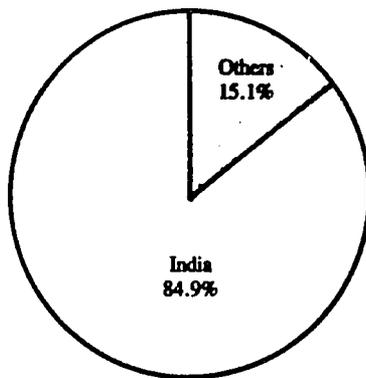
Average U.S. Per Capita Consumption

(Based on U.S. Imports)



Sources: USDA, FAS circular, FTEA Spices, Census Bureau

Percentage of U.S. Imports by Country 1981-1985



Sources: USDA, FAS Circular, FTEA Spices



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made without warranty of any kind, either expressed or implied. Purchasers are urged to make their own tests and investigations to determine the effectiveness of the products in their processes, in their products, and to prevent any possible patent liability arising out of such use.

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PRODUCT DATA

McCORMICK-STANGE FLAVOR DIVISION • FLAVOR SYSTEMS FOR A TASTE OF SUCCESS



VANILLA

Product Description

Vanilla is derived from the dried, cured beans or fruit pods of the large, green-stemmed climbing perennial *Vanilla planifolia*, a member of the orchid family. Vanilla beans are native to Central America and Mexico. The plant prospers in a humid, hot tropical climate where it is sheltered from strong winds, receives ample rainfall and adequate humus, and is elevated from sea level to about 2500 feet.

Its winding vine may grow wild to lengths of over 80 feet, scaling the tops of tall forest trees. As many as 1,000 pale yellow flowers may be produced from one vine; however, only 40 to 50 blossoms will be selected to be artificially hand-pollinated. The pods mature in four to nine months and are picked before they are ripe, just as their color starts to change from green to yellow. The beans then undergo a long and involved curing and drying process during which time their distinctive flavor and aroma character is developed.

About three years after planting, the first Vanilla bean crop can be harvested. Maximum yields are reached after seven or eight years. When the vines are ten to twelve years of age, they are no longer commercially productive and are abandoned.

Although Vanilla beans are sometimes used in their whole or ground form, they are most commonly used for producing extracts, flavors, oleoresins, and powders.

Forms

Pure Vanilla Extract — It is obtained by the hydroalcoholic extraction of cured dried Vanilla beans. The major chemical constituent responsible for the flavor of Vanilla is vanillin. Other subsidiary substances such as trace elements of other volatile flavorings, resins, gums, and fixed oil give pure Vanilla extract its delicately sweet, rich, spicy flavor and aroma. The largest use of Vanilla extract is in the liquid one-fold state. McCormick also supplies more concentrated folds in the liquid form along with offering a spray-dried version.

Vanilla Powder — This is a dry form of Vanilla flavoring made from the Vanilla bean. There are two types of Vanilla

What To Look For

The quality of Vanilla beans can be assessed by:

- Appearance/Luster: supple, typically about 7 to 10 inches in length; free of blemishes, mildew, splits and insect infestation; somewhat oily; shaped like a slim, long licorice-stick; occasionally exhibiting crystalline needles of vanillin—the primary flavor constituent of Vanilla beans.
- Color: dark brown
- Flavor & Aroma: delicate, sweet, rich flavor; spicy, highly aromatic; persistent exceptional fragrance

powder: Flavor Cap® Vanilla is a dry Vanilla flavor which has been emulsified with gum arabic and then spray dried. An **Extended Flavor** is a dry Vanilla flavor that is distributed on sugar, dextrose, lactose, modified food starch, corn syrup solids, or gum acacia.

Imitation Vanilla Extract — The flavorists of McCormick & Co. have developed an imitation Vanilla extract which closely characterizes the aroma and flavor profile of pure Vanilla extract. Composed entirely of natural and artificial flavoring substances, this product contains no Vanilla beans or extracts. It is available in 1, 5 and 10 fold strengths.

Origin and Plant Cycle

The islands in the Indian Ocean — Madagascar, Reunion and the Comoro Islands — produce the “Bourbon” Vanilla bean, which was named for the Bourbon Kings of Europe. These are considered to be the world’s highest quality beans, possessing a superior vanillin content.

Indonesia, particularly the island of Bali, is the next largest producer with its crop of “Java” Vanilla beans. Generally Java Vanilla is lower in vanillin content due to early harvesting. It is mainly used for blends of pure (natural) and artificial Vanilla utilized in such applications as Category II Vanilla “flavored” ice cream. The typical “smokey” charac-

ter of Java Vanilla is a result of oven drying of the beans rather than the sun curing process used for Bourbon Vanilla.

There are a few other Vanilla producing areas such as Mexico, Tahiti and Tonga, but the majority of the beans imported into the U.S. are of the Madagascar Bourbon and Java types.

Vanilla plants flower from October to December and are harvested between July and September. The beans are thick, firm, odorless and yellowish-green when ready to be harvested. The drying and curing process brings out the characteristic flavor and aroma of Vanilla beans.

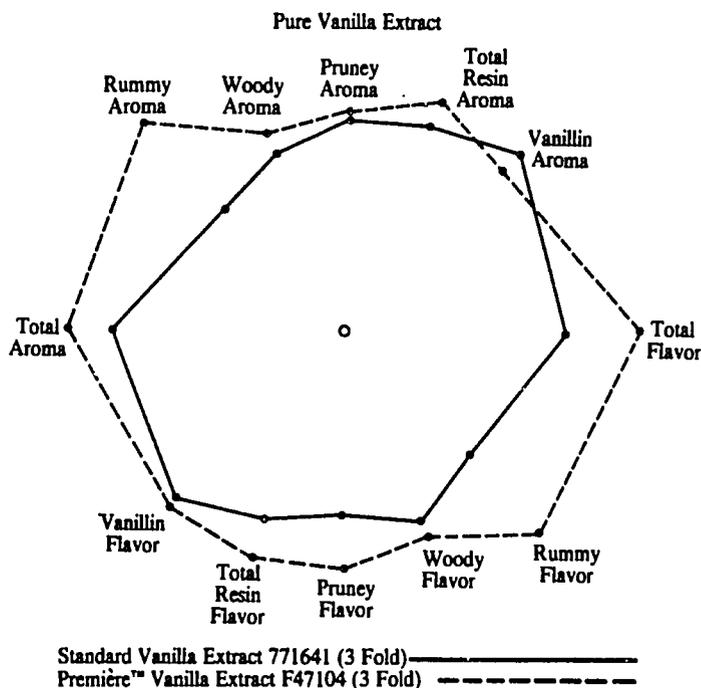
Sensory Profile

Pure Vanilla extract is characterized by its delicate fruity sweet, spicy flavor and aroma, which is a complex mixture of natural ingredients, some of which are unknown. Resinous, prune, woody, floral/perfumey and rummy notes are also commonly associated with Vanilla.

McCormick utilizes sensory evaluation techniques to graphically illustrate the intensity of flavor notes in pure Vanilla extract. Displayed at the right are the sensory profiles of McCormick’s Standard 3 Fold Pure Vanilla Extract (represented by the inner, solid-line figure) and McCormick’s new Première™ 3 Fold Pure Vanilla Extract F47104 (the outer, broken-line figure). Although the fold or concentration of both McCormick Pure Vanilla Extracts illustrated is equivalent (the vanillin content is unchanged), McCormick’s new Première™ Vanilla has undergone a process whereby it develops twice the flavor and aroma strength of the standard Vanilla extract on an impact equivalency basis. This enables McCormick’s 3 Fold Première™ Vanilla Extract F47104 to be substituted for a standard 6 Fold Vanilla extract, providing a 15-20% cost-in-use savings for the user. Besides the economic cost savings advantage, McCormick’s Première™ Vanilla Extract delivers a more “mature”, well-rounded, flavorful “bouquet” with an enhanced “rummy” highlight.

Through accurate identification of a taste target, McCormick can develop an optimal blend of its Première™ Vanilla Extract to achieve any desired flavor profile. For a description of the sensory evaluation methodology, please write:

McCormick-Stange Flavor Division
230 Schilling Circle South
Hunt Valley, Maryland 21031



Pure Vanilla Extract Specifications

Fold	1	2	3	3 1/3 Prime Percolate	5	10	Oleoresin (Standardized at 20 Fold)
Alcohol Content (min.)	35%	35%	35%	41%	35%	35%	<4%
Vanillin Content (min.)	.17 gm/dl	.34 gm/dl	.51 gm/dl	.566 gm/dl	.85 gm/dl	1.7 gm/dl	3.40 gm/dl
Flashpoint	82°F	82°F	82°F	77.5°F	81°F	82°F	>100°F

Principal Uses of Pure Vanilla Extract

There are four principal uses of pure Vanilla extract:

1. Single-fold extracts for consumer home use.
2. The baking industry uses it to produce high-quality, upscale baked goods and desserts.
3. The liquor industry uses it as an important ingredient in flavored distilled spirits to soften the harshness of alcohol. Additionally, it helps to "marry" the flavorful ingredients of liqueurs and cordials. Low strength Vanilla extracts are used as "blenders" in straight and blended whiskies to provide softening and flavor consistency.
4. A major use of pure Vanilla extract is in the Dairy and

Ice Cream Industries — particularly Category I Ice Cream, which must use only pure Vanilla extract and is generally made up of super and ultra-premium ice cream products. McCormick developed its new **Première™** Vanilla brand with this industry in mind.

In addition to the above areas, pure Vanilla extracts are used in a wide variety of soft beverages, confectionery such as chocolate, candy and fudge, puddings, non-dairy desserts and toppings, yogurt, milk, eggnog, tofu, cookies, cakes, donuts, pies, custards, icings, fillings and frostings. Some tobacco products and perfume materials use natural Vanilla extracts.

Applications

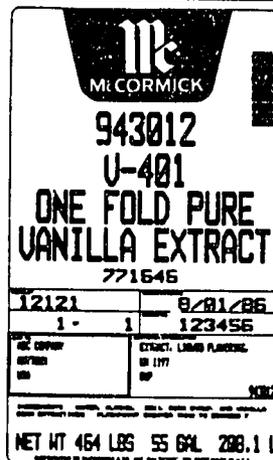
Suggested usage levels for a standard three fold pure Vanilla extract (V403) in various applications:

- .25 - .3% in Ice Cream
- .25% in finished drink (e.g. milkshakes and cordials)
- .3% in finished baked goods (e.g. cakes)
- .25% in finished desserts (e.g. pudding)
- .25 - .3% in finished frosting

Packaging

Packaging alternatives include 4 × 1 gallon jugs (case), 5 gallon pails, and 55 gallon drums.

McCormick's unique computerized labelling system prints all necessary information in a standardized, easy-to-read format which can be programmed to include customer specific data such as item codes, purchase order numbers, etc.



McCormick's Commitment to Quality and Customer Service

McCormick and Company is the world's largest extractor of Vanilla beans and has an outstanding worldwide reputation as a major supplier of Vanilla and other extracts. We demonstrate our commitment to the industry and our customers by maintaining multiple manufacturing locations and operating the world's largest and most modern Vanilla extraction facility, located in Hunt Valley, Maryland. As a result of an expansive resource base, which includes unparalleled access to raw materials and technical expertise, we can market a superior, consistently uniform product. In addition to product uniformity and safety, we guarantee that our extracts are pure, natural, and of the highest possible quality.

Consumers recognize the flavor profile of McCormick Vanilla to such a degree that it has become the industry

standard. We value our position in the marketplace and constantly research ways to more fully satisfy customer wants and needs.

Due to the increasing demand for Vanilla extract and the limited supply of Vanilla beans over the past years, it is important for Vanilla users to have a dependable source of high quality product. McCormick & Co. has developed an advanced analytical method to determine vanillin origin in Vanilla flavored products. This method, known as Stable Isotope Ratio Analysis or SIRA, determines the ratio of the naturally occurring isotopes of carbon C-12/C-13 present in a vanillin containing product. This establishes whether the vanillin isolated was "bean derived", synthetic or a mixture. A description of this procedure is available upon request.

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Quality Control

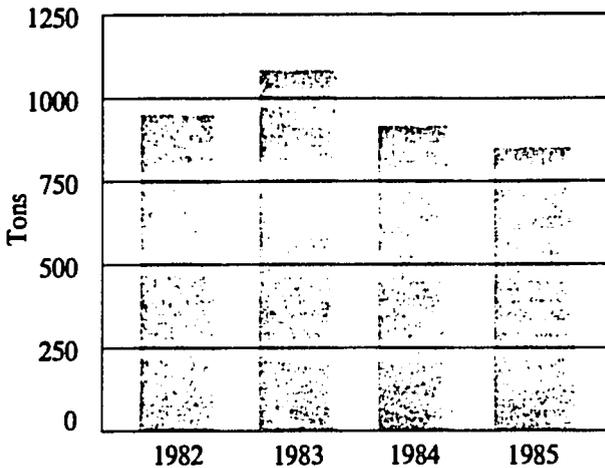
Vanilla is the only flavoring which must conform to a specified U.S. Standard of Identity. McCormick's pure Vanilla extract adheres to this standard as described in 21 CFR 169.3 and all other appropriate subparts. Briefly stated, a pure Vanilla extract must contain the extractive matter from 13.35 ounces of Vanilla beans at 25% moisture per fold per U.S. gallon. Minimum alcohol content is 35%. For example, a 10 Fold extract contains the extractive matter for 133.5 ounces of Vanilla beans at 25% moisture per U.S. gallon with a minimum of 35% alcohol. Only approved

optional ingredients are added to McCormick's Vanilla extracts as dictated in the Standard of Identity.

McCormick has acquired a reputation for honesty and product integrity, and will not adulterate its pure Vanilla products. All products are processed and manufactured under McCormick's exacting quality control standards which meet or exceed all applicable FDA and other government provisions. Product quality control tests regarding alcohol, vanillin, and moisture content are performed according to the latest AOAC methods of analysis.

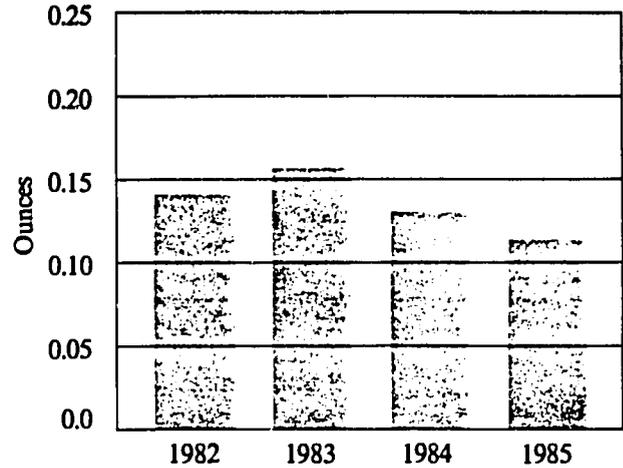
Vanilla Beans Facts

Average U.S. Vanilla Bean Imports



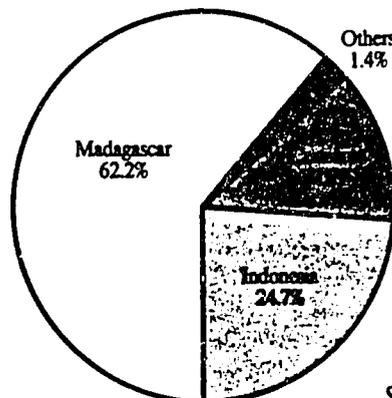
Average U.S. Per Capita Consumption

(Based on U.S. Imports)



Sources: USDA, FAS Circular, FTEA Spices, Census Bureau

Percentage of U.S. Imports by Country 1985



Source: FAS/USDA



McCormick Flavors

McCormick-Stange Flavor Division
Hunt Valley, Maryland 21031

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APPENDIX I

SUSTAIN Description

SUSTAIN provides access to U.S. business and scientific expertise to improve the quality, safety, and availability of food in developing countries. Technical assistance and training are provided by executives and technical specialists from U.S. food companies, universities, and professional associations who donate their time and expertise.

Many benefits can accrue to developing countries through improvements in food processing and preservation. These technologies can help meet food and nutritional requirements and reduce post-harvest losses. Improved processing can reduce food-borne illness, malnutrition, and micronutrient deficiencies that are devastating to children and other vulnerable populations. Strengthening food businesses helps reduce poverty by providing a means for enhancing job and economic growth in poor urban and rural communities. And the transfer of efficient technologies and management practices in waste handling, utilization, and reduction promotes environmental protection.

Through technical assistance and training, SUSTAIN volunteers help build the capacity of food businesses and local organizations in food manufacturing, management, and problem-solving. Areas of assistance include: food processing, preservation, and storage; food safety and quality assurance; fortification; packaging; marketing; waste handling; and business development and management.

How SUSTAIN Works

SUSTAIN conducts its activities in collaboration with USAID missions and local organizations. It receives support from the Food Technology and Enterprise Project of USAID's Office of Health & Nutrition in the Global Bureau (G/PHN/HN). SUSTAIN also receives support from the U.S. Department of Agriculture and cash and in-kind contributions from corporations and individuals. SUSTAIN receives advice from a Steering Committee made up of private sector representatives and is managed under a cooperative agreement with the National Cooperative Business Association (NCBA, known overseas as CLUSA).

SUSTAIN receives requests for assistance from individual food companies, research institutions, and business organizations in developing countries. Depending upon the nature of the request, SUSTAIN volunteers may be sent to conduct one-on-one technical assistance and workshops or participate in assessment missions. Overseas projects are typically one to three weeks in duration. Through repeat visits of volunteers on particular projects, SUSTAIN is able to provide continuity and on-going problem-solving expertise. SUSTAIN is also able to address many problems through correspondence by providing information that exists either in technical literature or in the "memory" of a company.

SUSTAIN covers international travel costs. Companies or host organizations requesting SUSTAIN assistance are asked to contribute towards in-country expenses. Priority is given to requests that can demonstrate an ability to improve the nutritional quality, safety, and availability of food in the local community. SUSTAIN does not fund product or equipment acquisitions.

SUSTAIN publishes a quarterly newsletter (*SUSTAIN Notes*) on food technology issues. It is provided gratis to over 2000 recipients in more than 50 countries. For more information, contact:

SUSTAIN

1401 New York Avenue, NW; Suite 1100
Washington, DC 20005-2160
Phone: (202) 638-6222, Fax: (202) 628-6726

APPENDIX II

Biographies of SUSTAIN Volunteers

Bruce Gaylord (B.A. Political Science, Purdue University) is Project Manager with Autumn Harp, Inc., the U.S. manufacturer of all-natural skin care, cosmetics, and fitness products for Body Shop, where he coordinates the development of natural, environmental skin care products, prepares and communicates new product documentation packages, researches and sources environmentally responsible packaging, and compiles and analyzes project costs. Previously as Operations Manager and Sales Manager at Autumn Harp, he built a constructive, cooperative environment with an emphasis on problem-solving through education and information sharing, interfaced with regulatory agencies to meet regulations, developed and implemented strategies to increase sales, and explored and expanded into new markets. As a Peace Corp volunteer in Liberia, Mr. Gaylord organized and trained human resources, developed leadership and management capability of local leaders to find local solutions for local problems, and managed rural natural resource to build schools, markets, roads, and clinics to improve the quality of life for people.

Donald Lindemann (B.S., Packaging Engineering, University of Wisconsin, 1982) is Senior Packaging Engineer at Land O'Lakes, Inc., where he manages the development and implementation of new packaging designs, new machinery purchases, and machinery modifications. Previously he was a Packaging Instructor at Wisconsin Indianhead Technical College, Packaging Engineer, Project/Process Engineer-Packaging at Kimberly-Clark Corporation, and Packaging Engineer at R.J. Reynolds. Mr. Lindemann has co-authored five U.S. Patents. He is an officer of the Minnesota Chapter of the Institute of Packaging Professionals. As a SUSTAIN volunteer, Mr. Lindemann taught a packaging workshop in Uganda.

John Nelson, Ph.D. (Biochemistry, Microbiology, University of Minnesota, 1961) recently retired as Vice President-Science and Technology of McCormick & Company. He was formerly Director of Research & Development and Vice President-Research & Development with McCormick; Chief Operating Officer with Roman Meal Company; Vice President, Marketing & Product Development with American Maize Products Company; Vice President, Research & Development with Peavey Company; and Department Head, Research & Development with General Mills, Inc. His areas of expertise include business management, processing of cereals and legumes, and marketing. Dr. Nelson is active on numerous professional and advisory groups, including the Governor's Conference on the Future of Maryland Agriculture, the Institute of Food Technologists, and the AACC. He has participated in missions to 8 developing countries to assess their food industries and provide technical assistance and training.