TDC/EED
TRADE DEVELOPMENT CENTER PROGRAM
EXPORT ENTERPRISE DEVELOPMENT PROJECT

FOOD PROCESSING FIELD NOTES:
Fruits And Vegetables

Prepared For:
USAID/Cairo
Contract No.263-0226-C-00-3095-00

Submitted by:
Roy Bosley
CHEMONICS INTERNATIONAL INC.

August 1993

August 13, 1993

MEMO TO THE FILES

SUBJECT: CHEMONICS EGYPTIAN USAID PROJECT--PROCESSING OF POTATOES

The following materials are submitted for considerations and understandings to evaluate a full process line to produce dehydrated potato products. This communication will reflect the differences between dehydrated potato slices and/or dices as compared to dehydrated potato flakes.

JUSTIFICATIONS FOR DICED, SLICED OR SHREDDED VEGETABLES, SPECIFICALLY POTATOES

- It is believed that a discreet physical form of product such as slices and diced vegetables would have better acceptance with the INTERNATIONAL EXPORT MARKETS rather than to have just a puree of mashed potatoes having been produced by a drum dryer type of line.

- The slice/dice line can produce dehydrated products from vegetables such as carrots, beet-roots, turnips; and furthermore it could be adapted to be able to produce evaporated fruit slices/dices if fruit trees might be available in the vicinity.

- The finished dehydrated products produced from such a dehydration line have many possibilities to have sauces and flavor ingredients to be added in the package so that the consumer can prepare complete casserole dishes such as scallops, au gratin, and other dishes.

- It can be possible to produce dehydrated shredded style vegetable products on the process line. If potatoes were to be shredded and dehydrated, then upon reconstitution in boiling water for a brief

period of time, the cooked potato shreds could be then fried into what we call "hash browns", or Europeans call "Rosti".

- Furthermore, the dehydrated diced products can be mixed with meat, other flavor ingredients and water and be placed in a can or glass bottle and be heat retorted to produce a variety of canned products. One such Russian product could be the Borscht.

JUSTIFICATIONS FOR DEHYDRATED POTATO FLAKES

- From a production point of view the potato flake line will produce approximately the same kg per year of dehydrated potato product for approximately the same amount of capital investment for the dehydrated potato slice/dice line equipment. However, the high pressure steam drum dryers will require more kg of high pressure steam than would the dehydrated potato slice/dice line.

- Dehydrated potato flake type of product is presently known in most European and Middle East Export Markets; where-as the dehydrated slice/dice products may be new products and might require inputs of training to educate the foreign consumers on the merits to use the dehydrated slice/dice products.

- Properly formulated, the potato flakes can be re-manufactured to allow snack potato products, such as potato chip like products, to be produced from the dehydrated powder.

COMPARISON OF THE SLICE PROCESS VERSES THE FLAKE PROCESS

SLICE PROCESS	FLAKE PROCESS
-Input of potatoes	-Input of potatoes
-Conveyor to surge bin	-Conveyor to surge bin
-Surge bin	-Surge bin
-Wash system	-Wash system
-De-stonner system	-De-stonner system
-Steam Peeler	-Steam Peeler
-Scrubber system	-Scrubber system
-Inspection & trimming	-Inspection & trimming
-Conveyor to surge bin	-Conveyor to surge bin
-Surge bin	-Surge bin
-Slicing system	-Slicing system
-Blanch	-Pre-cook blanch -Quencher system -Steam cooker -Ricer system & mixer -Additive systems
-Three stage continuous belt dryer	-16' x 5 ' high pressure drum dryer
-Conveyor to storage bins	-Conveyor to storage bins
-Storage bins	-Storage bins
-Packaging area	-Packaging area
-Requires high pressure boiler	-Requires high pressure boiler

ASSUMPTIONS USED TO DETERMINE PRELIMINARY BUDGETARY COSTING OF A DEHYDRATED VEGETABLE SLICE/DICE AND OR A DEHYDRATED POTATO FLAKE PROCESS LINE:

- The anticipated processing area would have:

  - Natural gas available to the processing site;
  - Approximately 20,000 metric tons or more of potatoes per process season;
  - The ability to irrigate, or otherwise dispose of processing waste waters;
  - All processing would be completed in eleven months per year with one month free to do maintenance work;
  - The process facility would operate 24 hours per day, at least six days per week;
  - The client would provide the building, and installation labor, the seller of equipment would supervise the erection of equipment with American personnel;
  - The labor pool to support this facility;
  - No high pressure boiler is included in the cost-budget proposal;
  - No waste water or solids waste handling are included in the proposal;
  - No storage for raw or finish materials are included in the proposal;
  - No rolling stock or vehicles are included in the proposal;
  - Steam, water, air lines and waste water flumes not included in the proposal;
  - No electrical transformers, sub-stations, or distribution wiring networks are included in the proposal;
  - Storage facilities would be available to store the harvested potatoes during approximately nine to ten months per year;

CONSIDERATIONS ABOUT THE POTATO PROCESSING MACHINERY

- For this budgetary presentation, the supplier of equipment would provide the equipment to produce and carry the dehydrated finish product to the packaging storage hoppers. A 45 kg bag packaging systems is included in the flake line proposal since we lack sufficient information to understand what type(s) of packaging equipment might be desired or needed for either the slice/dice or the flake line.

- The prospective owners of the facilities will have all responsibilities to deliver to the intake point in the raw receiving area sufficient quantities of materials during an eight hour period to be able to run during the entire 24 hour period. A 16 hour raw intake storage bin will be included in the proposal.

- No provisions are made or implied to furnish acceptable or suitable formulations of casserole types of seasonings & ingredients that might/could be adapted to make complete dinners for this proposal presentation for the dehydrated slice/dice facility.

- This proposal is for budgetary-education-evaluations purposes and until suitable information and understandings are available, no guarantee of price is made or implied.

- The equipment supplier will provide requirements for the space needed and line design to maximize the effectiveness and line efficiencies to save in building costs, as well as the requirements such as electrical, steam, compressed air that will be needed to operate the facility.

CONSIDERATIONS ABOUT THE SUPPLIER OF THE POTATO STORAGE, 15,000 metric TONS

- Hansen-Rice Inc is furnishing the budgetary information for the storage of approximately 15,000 metric tons of potatoes to be used in the production of dehydrated potatoes for the client in Russia. Under separate information contained in this communication, Hansen-Rice will provide more explicit information describing what they propose for the storage. There will be certain areas that will not be covered in their proposal since insufficient information is available to be able to offer a definitive budget price.

PRODUCT FLOW ANALYSES FOR DEHYDRATED SLICE/DICE FACILITY (*)

IDENTITY	KG/HR	KG/24 HR	mTon/25 DAY	mTon/11 MONTH
-Raw input	1,818	43,636	1,091	12,001
-Peel & Trim loss	(273)	(6,545)	(163)	(1,793)
-To dryer	1,545	37,087	927	10,197
-Exit dryer	327.24	7,853.56	196.34	2,159.7
-Into package	301.79	7,242.96	181.07	1,991.8
-Recovery (*)	**16.6%** and will be directly related to the raw product input quality (assuming 80 percent moisture at input, and approximately 7.5 percent in the final dried product).			

RECONSTITUTION INFORMATION

Please be advised that the normal reconstitution of dehydrated potato products such as slices and dices can be accomplished in several ways:

(1) Stove top method: The dehydrated product is placed into boiling water for a period of 10 to 15 minutes, then removed and drained. At this point the product is ready to be eaten, or can have other condiments added to suit the taste of consumer.

(2) Oven method: The dehydrated product is placed into a shallow baking pan, a measured amount of water or water-milk combination is added, along with other options condiments & sauces, and allowed to bake at 200 to 210 ° C for approximately 25 to 30 minutes.

(3) Retort canning methods: This is usually a commercially produced product that has a combination of meat, onion, garlic, seasonings added along with water to the potatoes and is heat retorted under pressures and temperatures that are required for complete sterilization of all products within the container.

Under methods 1 & 2 it is normal to have 4 parts of water to be absorbed by 1 part of potatoes; hence 1 kg of potatoes will combine with 4 kg of water to result in a finished cooked reconstituted state 5 kg of finish product.

PRODUCT FLOW ANALYSES FOR DEHYDRATED POTATO FLAKE FACILITY (*)

IDENTITY	KG/HR	KG/24 HR	mTon/25 DAY	mTon/11 MONTH
-Raw input	2,664.6	51,398	1,284.9	14,134.5
-Peel loss	(266)	(5,985)	(14.9)	(1,645.9)
-To packaging	386.4	8,693	217.32	2,390.625

-Recovery (*) **14.4 %**, and will be directly related to the raw product input quality (assuming 80 percent moisture at input and 7.5 percent in the final finish product).

RECONSTITUTION INFORMATION FOR DEHYDRATED POTATO FLAKES

Please be advised that the normal reconstitution of dehydrated potato flakes is done to prepare hot mashed (puree) mashed potatoes. Usually for consumers to prepare the hot mashed potatoes the following recipe is followed:

- 590 ml of water is brought to a full boil and removed from heat,
- 118 ml of cold milk is added to the boiling water,
- 150 grams of potato flakes are added to the hot liquid and gently stirred in and allowed to rest for approximately 30 to 60 seconds; then the hot mash is gently stirred to combine all the dry flakes with the hot liquids.

CONSIDERATIONS AND JUSTIFICATION FOR 15,000 metric TONS OF CONTROLLED ENVIRONMENT POTATO STORAGE

- For financial justification to support a capital expenditure investment it usually is mandatory that the process facilities be kept running for as many months per year as is possible.

- The following are the assumptions and logic to describe the needs and timing of potatoes to support the proposed dehydrated potato process facility:

- This facility and its controlled environment has been shown to maintain five percent shrinkage over 10 to 12 months.

ASSUMPTIONS USED:

- Potatoes will be harvested starting in August, and continuing through September, and possibly into first week or so of October (weather dependent);

- Storages to start filling in September and continuing through the harvest till complete;

- Storages to hold approximately 15,000 metric tons;

- Early processing potatoes will be taken directly from the field at harvest during August and September, and perhaps into October;

- The processing facility will operate eleven (11) months per process season campaign;

- Estimated monthly raw potato usage should be 1,295 metric tons.

MONTH	NEEDS	STORAGE REQUIRED	LOCATION
August	1,295 ton	no	from the fields
September	1,295	yes to fill storage	from the fields to fill storage
		no to operate process	from the fields to run plant
October	1,295	yes to operate process	from the storage
November	1,295	yes to operate process	from the storage
December	1,295	yes to operate process	from the storage
January	1,295	yes to operate process	from the storage
February	1,295	yes to operate process	from the storage
March	1,295	yes to operate process	from the storage
April	1,295	yes to operate process	from the storage
May	1,295	yes to operate process	from the storage
June	1,295	yes to operate process	from the storage
July	zero	no, facility down for repairs and maintenance	

This concept paper is designed to acquaint persons to understand the many detailed considerations that are involved to evaluate the needs and requirements to establish a dehydrated potato processing line.

Before one should attempt to sell or contemplate the exactness of equipment and types of equipment, a comprehensive "in-country" evaluation should be undertaken. The purpose of an in-country study is to know the strengths, weaknesses, the opportunities and the threats of a business decision. Once these elements are identified and understood it can be possible to write a business plan, have the detailed engineering-design conducted, the complete understanding of sourcing of all raw materials (not just the potatoes), and where products will be sold, the distribution systems and their problem areas, and the beginnings to prepare the ultimate customers for new products with good appeal and value for the money spent to purchase.

The preliminary budget estimates for a dehydrated potato slice & dice line is US $ 2,394,900.00 (F.O.B sea vessel at Alexandria, Egypt). It does not include permits, fees, licenses, duty, utilities or land freight to the site. To have a hard/firm quotation will require more detailed evaluations and study. This budget estimate is for the processing equipment and does not reflect any storage facility, delivery to the process receiving area, nor the packaging equipment or the storage for the packaged or materials in process. Formal budget estimates included here-in.

The preliminary budget estimates for a dehydrated potato flake line is US $ 2,488,300 (F.O.B. sea vessel at Alexandria, Egypt). It does not include permits, fees, licenses, duty, utilities or land freight to the site. To have a hard/firm quotation will require more detailed evaluations and study. This budget estimate is for the processing equipment and does not reflect any storage facility, delivery to the process receiving area, nor the packaging equipment or the storage for the packaged or materials in process. Formal budget estimates included here-in.

The preliminary budget estimates for a 15,000 metric ton controlled environment potato storage warehouse is US $ 1,700,000.00 (F.O.B. sea vessel at Alexandria, Egypt). It does not include permits, fees, licenses, duty, site preparation, land freight to site and no utilities. The proposal will indicate the approximate manhours required by customer to erect, an estimate of concrete required is provided however, until we know the depth of frost it is only to be considered an estimate since the frost computed was based on one meter depth. An allowance has been included to cover an estimate of electrical wiring, but will need to be verified. Formal budget estimates included here-in.

Please let me know how you wish to proceed. I thank you for this opportunity to try to assist you in your endeavors to sell potato processing facilities in Egypt and I shall hope that positive reactions will result from this project.

Sincerely,

Roy E. Bosley

September 5, 1993

SUBJECT: EGYPTIAN FRUIT CROP STUDY (FRUITSTY)

FROM: ROY BOSLEY (RXB)

OBJECTIVE: Mr Rick Miller (Chemonics) requested I give thought on how to find ways to get better financial returns to small Egyptian farmers who have planted grapes, apples and peaches for their Main Crops.

PROBLEM: When originally planted the market prices for the fresh crops were Le 6.0 per Kg(?), but due to too many farmers (possibly too much imports) there are oversupplies and the market prices have been depressed to Le 1.0 per Kg(?).

SUGGESTED SOLUTIONS: (A) JUICES; (B) DEHYDRATED PRODUCTS: (C) CANNED-- (RXB ADDED); (D) FROZEN; AND (E) RXB ADDED--CHILLED STORAGE OR CONTROLLED ATMOSPHERE (CA) STORAGE.

1.00 QUESTIONS AND CONSIDERATIONS FOR APPLES

1.01 How many acres (a) per farmer, (b) per variety per farmer, (c) total acres of apples, and (d) total acres of apples per variety?

1.02 Exactly what varieties are being considered?

1.03 How old are the orchards?

1.04 How many tons per variety per acre, per farmer, per total apple crop, and per total apple crop per variety?

1.05 How many growing areas are involved in Egypt?

1.06 What radius are we considering to encompass the total apple crop?

1.07 What competition does larger apple farmer hold over the smaller farmer?

1.08 What months are the apples (per variety) harvested and for how long?

1.09 Do cold storage or controlled storage (CA Storage) exist?

1.10 What market research has been conducted on potential domestic and export markets for any processed apple products?

1.11 What is the break even price that farmer must expect to

establish a bench mark for possible processing costs of raw materials?

1.12 What market research has been done to identify possible exports of fresh apples to others? How might Controlled Atmosphere storage change the situation to supply markets during off seasons?

1.13 From Market Research, what is the most realistic price(s) FOB the factory, must we be targeting upon?

1.13 Who is presently supplying these markets (domestic and export) and how will the competition react if Egypt brings in products? (Note--there is little need to develop new products and all this does is to depress the targeted markets, since the competition will most probably retaliate by reducing their prices to keep and maintain their market share).

1.14 Are any of the smaller farms large enough to be able to support a processing facility; or is there needs to consider (A) formation of farmer cooperatives; or (B) having a larger company purchase the raw materials from the individual farmers to support a larger facility?

1.15 Considerations must be given to know how many tons of apples per day and for how many days during the entire crop harvest season will be directed to the processing facility to be able to properly size the equipment.

1.16 Considerations must be given to strategically place the processing facility(ies) in close proximity to the majority of grown crops in each and every apple growing region being considered.

1.17 Once the tonnages have been fairly accurately ascertained, we will need to get budget price quotations for the different types of processing we might focus upon.

1.18 Once the target markets for finish products and estimated FOB prices are established, then an extensive cost of production for each product must be make to understand the estimated profit margins.

1.19 Once the tonnage, cost of goods sold and estimated profit margins are established, we will need to:

- Conduct "What If" computer modeling to be able to arrive with (a) a reasonable optimistic, (b) a most probable, and (c) a worst case situation for profit returns for such a venture. WHAT IS THE R.O.I. FOR EACH OF THE TARGETED PROCESSED TYPES OF APPLE PRODUCTS?

- Conduct realistic five year cash flows and determine the quantities of monies and interest required to service the credit line for each of the targeted products targeted.

1.20 What other new products might be considered that have higher perceived value: e.g.; apple juice; frozen apple pies; apple cakes/cookies; granola type snack bars, or apple strudel; apple snacks; fruit leather; apple sauce or others?

2.00 QUESTIONS AND CONSIDERATIONS FOR PEACHES

2.01 How many acres (a) per farmer, (b) per variety per farmer, (c) total acres of peaches, and (d) total acres of peaches per variety?

2.02 Exactly what varieties are being considered?

2.03 How old are the orchards?

2.04 How many tons per variety per acre, per farmer, per total peach crop, and per total peach crop per variety?

2.05 How many growing areas are involved in Egypt?

2.06 What radius are we considering to encompass the total peach crop?

2.07 What competition does larger peach farmer hold over the smaller farmer?

2.08 What months are the peaches (per variety) harvested and for how long?

2.09 Do cold storage exist?

2.10 What market research has been conducted on potential domestic and export markets for any processed peach products?

2.11 What is the break even price that farmer must expect to establish a bench mark for possible processing costs of raw materials?

2.12 What market research has been done to identify possible exports of fresh peaches to others? How might Refrigerated storage change the situation to supply markets during off seasons?

2.13 From Market Research, what is the most realistic price(s) FOB the factory, must we be targeting upon?

2.14 Who is presently supplying these markets (domestic and export) and how will the competition react if Egypt brings in products? (Note--there is little need to develop new products if all this does is to depress the targeted markets, since the competition will most probably retaliate by reducing their prices to keep and maintain their market share).

2.15 Are any of the smaller farms large enough to be able to support a processing facility; or is there needs to consider (A) formation of farmer cooperatives; or (B) having a larger company purchase the raw materials from the individual farmers to support a larger facility?

2.16 Considerations must be given to know how many tons of peaches per day and for how many days during the entire crop harvest season will be directed to the processing facility to be able to properly size the equipment.

2.17 Considerations must be given to strategically place the processing facility(ies) in close proximity to the majority of grown crops in each and every peach growing region being considered.

2.18 Once the tonnages have been fairly accurately ascertained, we will need to get budget price quotations for the different types of processing we might focus upon.

2.19 Once the target markets for finish products and estimated FOB prices are established, then an extensive cost of production for each product must be make to understand the estimated profit margins.

2.20 Once the tonnage, cost of goods sold and estimated profit margins are established, we will need to:

- Conduct "What If" computer modeling to be able to arrive with (a) a reasonable optimistic, (b) a most probable, and (c) a worst case situation for profit returns for such a venture. WHAT IS THE R.O.I. FOR EACH OF THE TARGETED PROCESSED TYPES OF PEACH PRODUCTS?

- Conduct realistic five year cash flows and determine the quantities of monies and interest required to service the credit line for each of the targeted products targeted.

2.21 What other new products might be considered that have higher perceived value: e.g.; frozen peach pies; granola type snack bar; peach snacks; peach nectar or other products?

3.00 QUESTIONS AND CONSIDERATIONS FOR GRAPES

3.01 How many acres (a) per farmer,(b) total project?

3.02 What varieties are we talking about? Are they seeded or seedless varieties?

3.03 How old are the vineyards?

3.04 How many tons per acre? per farmer Mean? per variety?

3.05 How many growing regions?

3.06 What radius are the vineyards grown for target or total areas?

3.07 What competition does large vineyards have over small farmers?

3.08 What months are the grapes harvested?

3.09 What market research has been conducted for exporting grapes and or by-products of grapes?

3.10 What is the break even price the farmer needs to establish the bench mark?

3.11 What market research has been done to show any unfulfilled needs or wants of the domestic and export markets?

3.12 What impacts would new products have to the existing markets, and how will competition react? (If any of these markets are near to being saturated, any new products will lower the price to maintain their market position and Egyptian product might now be competitive, and we haven't solved anything).

3.13 What possible product be made from grapes? Grape Juice, grape jelly, grape leather, wines, brandy, raisins. Need also to possibly consider conversion to sugar--to glucose--to glycol and poly-glycols. Might be able to convert from sugars to dextrin and dextrin types of glues.

3.14 Careful considerations need be taken to size the raw input to the facility to be able to handle all that will be harvested in limited periods of time. This might also include storage for "in-process" products such as bulk tanks etc.

3.15 Will need to gather good budgetary costs for all aspects of potential products to understand the intensity of capital required.

3.16 Will need to gather good costs of manufacture estimates to be able to project profit potentials over the first five years of production.

3.17 Conduct cash flow projections and costs to service line of credit.

3.18 Need to conduct "What If" computer modeling to arrive with (a) realistic but optimistic, (b) most plausible,(c) and worst case scenarios to be able to establish the R.O.I.

3.19 Identify the location(s) of where the facility should be located.

3.20 Are the smaller farmers large enough that their crops could support a grape processing facility, or will there be needs to have Coops or other larger companies purchase the grapes and to the production and marketing of all products?

September 7, 1993

TO: Dr. Farouk A. Zaki

FROM: ROY BOSLEY

SUBJECT: AGRI-BUSINESS SECONDARY INFORMATION

CC: RICK MILLER

Pursuant to our discussion, since you will be at MOA meeting with Dr M.M. Helmy tomorrow, I would appreciate it very much if you can inquire of their Computer Center (or otherwise) what information or specialized library materials they might have or to whom we can follow up with to attempt to pull together a fairly comprehensive evaluations data base for our future needs. The following is my "Punch List":

1. The list of fruits and vegetables that may have been grown, or is presently grown, or might possibly be grown in Egypt:

   - FRUITS: Blueberries; cranberries, raspberries, blackberries, pineapple, bananas, strawberries, pears, apples, peaches, nectarines, plums/prunes, grapes, mangos, kiwi, oranges, Maltaise oranges, lemons, limes, tangerines, mandarin oranges, melons, watermelons, tomatoes, cherries, figs, dates, guavas, papayas, or avocados.

   - VEGETABLES: Onion (green/fresh & dry), garlic, potatoes, peppers, cucumbers, carrots, zucchini, cauliflower, broccoli, sweet corn, pop corn, baby corn, sweet peas, green beans, okra, head lettuce, cabbage, squash, chick peas, peanuts, or asparagus.

2. I am looking for information/data bases that may provide historical information as to if they have or are being grown, why not if they aren't; and the following specific information:

   - tonnages
   - farmgate prices
   - geographical area where grown and limiting factors
   - problems and issues
   - MOA crop recommendations and issues

3. What information where any of the listed crops may have been exported, presently being exported into:

   - Scandinavian countries
   - Western Europe
   - Southern Europe
   - The United Kingdom

- C.I.S.countries or ex-USSR
- Middle East countries
- South Asia
- South East Asia
- Africa
- Others?

4. What country profiles (relative to agricultural products consumption might they have for:

   - Sweden, Norway, Finland
   - Denmark, The Netherlands, Belgium, West and East Germany
   - France, Spain, The UK
   - Italy, Greece, Austria, Switzerland
   - Poland, Czech & Slovak, Hungary, Romania, Bulgaria, Yugoslavia
   - Ex-USSR, or specifics to C.I.S. countries/Republics
   - Iran, Iraq
   - UAE, Saudi Arabia, Bahrain, Qatar, Oman
   - Africa (South, East, West).

5. What balance of payments does Egypt have (negative or positive) with any of the countries listed in statement # 4, and what might any of the C.I.S. countries have that would be worth of barter trade with Egypt for its exportation of produce?

This is a lot to ask, but sooner or later we will have to get this information to be able to pull together a comprehensive business plan.

I thank you and Dr Helmy for your assistance.

ROY BOSLEY

Kick -

September 8, 1993

TO: THE FILES

FROM: ROY BOSLEY

SUBJECT: INTERVIEW WITH HANI EL KOLALY, GRAPE GROWER-RAISIN PRODUCER

Mr El Kolby previously was an electrical engineer who returned to farming of grape vineyards and about five years ago he started the drying of grapes to produce raisins for the local markets. His big time of the year was during Ramadam and has been doing fairly well but suffering when Egypt opened the door for the importation of raisins with low duty. These products came from Iran and mainly Turkey. He pushed and received duties of 80 percent on these imported raising.

However the Turks out maneuvered him and were able to bring in products of the 91 crop year and sell for considerably less than what he can market for. The Turks priced the raisins dirt cheap since the product only had approximately 4 months shelf life remaining, and consequently as a result of low cheap price plus the 80 percent duty still brought the retail price cheaper than he could sell to the wholesale buyers. The imported raisins were priced at retail 5.0 to 5.5 LE/kg and his price to wholesales was 5.5 to 6.5 LE/kg.

He has now given up hopes to continue producing raisins. Instead he plans to harvest the grapes, put them in a special bag (with Sulfur Dioxide in the Bag) and will pre-cool down to zero degrees C and hold until the Christmas-New Year Holidays and sell as fresh.

We talked at considerable lengths of the Egyptian consumer markets. He feels that you can only target ten to fifteen percent of the population of Egypt and focus the sales to possibly fifty to sixty percent of the people living in the major population centers between Cairo and Alexandria.

He was very keen on the Betty Crocker potato dinners that were shown to him and felt there would be good domestic markets in Egypt if properly marketed and advertized with TV-ads and promotions.

He thought the potato flakes might be the first step in potato processing since many people eat masked potatoes, where-as the complete dinners would require the extra efforts to promote.

ROY BOSLEY

September 8, 1993

TO: RICK MILLER

FROM: ROY BOSLEY

SUBJECT: INTERVIEW WITH AHMED NASSAR (file NASRVUE.08)

CC: ABDEL RAZEK

This grower is a proposed associate member (New Desert Growers Association) and was reported to have three farms: (a) one 170 km South of Cairo, the main farm; (b) in the Nile Delta; and (c) didn't catch the name of the area.

Mr Nassar is a very specialized type of Modern Farmer. He has 400 500 meter^2 greenhouses, 50 percent full head height, 50 percent of low cover. Approximately 2/3's of growing is done in the houses and 1/3 in open fields (approximately 100 acres of land). He is very keen on export, but will not grow a specialized vegetable crop unless he has a domestic back up market. Some of his export crops are air freighted to the export markets, some by land transit and some by sea containers. He has been experimenting with new German technology using special refrigerated containers that can control: the temperature, the oxygen levels, as well as the levels of ethylene.

(NOTE: We should obtain detailed technical information on these containers as they might prove to be very beneficial to ship produce to foreign markets via sea and have the quality just as good after 20 days transit as when it was loaded. I was informed that USAID provided the technical understanding in some way. We also should follow up to understand this situation!!

Airfreight is used for those crops, and at certain times that warrant and justify the costs of $900 to $1,000 per ton; otherwise he ships competitively where possible via land transport and sea containers to London, Amsterdam and Frankfurt.

Fresh onion exports used to be a very large tonnage to USSR and other places; however, a soil borne bacteria has decimated the export market with what is called the **White Fungi**. The Delta onion farmers laterally caused this serious disease to be so widespread in that they didn't have the right variety to resist, but also they compounded the problem by repeated growing onions back to back, year after year. The Nile Delta area is no longer suitable area for growing dry onions; the newer desert areas are just now picking up the slack and are following a proper program to avoid the same mistake.

Onion dehydration has received a new shot in the arm since an

American company has built a new facility that is dehydrating white dry onions, parsley and other suitable high value crops. We should learn more about this operation and possibly visit them.

Bunching green onions is the new rage. The market is the United Kingdom as is moving 20 ton per week air freight.

Previously he had a lot of green sweet peppers growing in his green houses and with different crops phasing in at various times of the year due to seasons and demands. Now only 1/3 of his 400 houses are cultivated with peppers, the other 2/3 are pushing hard to grow and keep up with green beans for export. Relative to the sweet peppers he grows: Green; Red, Yellow: White and some Chocolate varieties.

His biggest competition is Spain, and hence he concentrates on growing those crops that are very to extremely labor intensive, since the Spaniards have considerably higher labor costs. Depending on weather and temperatures in Southern Spain, he open can beat the Spaniards into the markets by 20 to 30 days on very important early crops; some from the green houses, some from the fields.

His normal crop rotation in the houses are:
Cucumbers to Green Beans to Sweet Peppers.

His procedures in the houses are to use sand + mixture of poultry manure mixed with inorganic fertilizers and to use drip irrigation that has a mixture of nutrients of fertilizers, insecticides etc.

Concerning tomatoes: he uses his houses only for cherry tomatoes and very specialized new types of tomatoes that fetch $6 to $8 per kg. The commercial tomatoes can't be cost justified in the houses for his exportation unless the export customer will guarantee the prices.. White Fly is a National problem, but using phased timing of planting good crops without the fly infestation is possible for exportation. His planting of field tomatoes starts in June, and by carefully spraying insecticides on very frequent basis during the early growing season he can escape the problem and harvest in the later autumn. The fly problems start in June and are completely gone by late August-early Sept and he has controlled his crops of tomatoes.

Cauliflower and Broccoli could be potential markets since the Egyptian "on season" is in the dead of winter in all of northern Europe. His competition is Morocco and Southern Italy during these periods, and is hard put to justify the air freight. Sometimes the Southern European is cold and he can beat them into the markets.

Sweet cob corn has tremendous potentials, and is weather dependent to hit the hot markets. If he is lucky and can plant 60 day variety in early March he can have all of May and June to fill the high priced European markets before Southern Italy, Spain and Morocco can get in. Fresh corn can run on into July, but all must

be shipped via sea containers. Egyptian KFC has built up a fairly sized business with their cob corn, unfortunately at the present they import frozen cob from the United States and pay dearly for it. Mr Nasar has been in contact with them and might be able to work out a deal to grow for periods of time. **What is needed is to have the right corn varieties grown in Egypt and processed into frozen and be able to inventory and distribute through-out the year to domestic and export markets.** **Corn is very profitable to him!**

He has been recently growing Sugar peas and Sugar Snap peas. There is a big market for both in Italy. It is a very labor intensive crop and his competition is from South America and Africa.

He doesn't grow Zucchini because there is no back up market in Egypt. There is a demand in Europe, but without the back-up it is no deal.

As to contracts with farmers. He believes that a processor should have fair contracts for the growers to sign. Most farmers will be bound legally and ethically to these contracts. However, he feels a processor should have only fifty percent under contract and fifty percent on open market position; this is usually the method many American processors follow.

Concerning potatoes:

- Up until several years ago Egypt grew huge potato crops and exported to UK mostly; however, the Delta farmers have been nearly put out of business by Ring Rot.

Concerning Egyptian Frozen Foods. You can find Green Beans, Peas, Cauliflower, Okra, Molokia (leaf type crop), Carrots and Brussel Sprouts. There are four private food processors and 2 Public Sector processors of vegetables in Egypt. These processors are not quality processors--they buy on low price and the resultant quality is evident in the finish product. He feels there is a high demand for frozen foods in Egypt and certainly there is a need for quality frozen foods.

Concerning Priorities we should/might wish to consider:

1 priority to develop the Sliced Dried Apples;
2 priority to develop the evaporated fruits;
3 priority to develop the dehydrated Potato Dinners and flakes.

I would like very much to visit his main farm and to have further discussions (time permitting) later after I have obtained more overall information.

ROY E. BOSLEY

September 8, 1993

TO: RICK MILLER

FROM: ROY BOSLEY

SUBJECT: ISMAIL SABRY TRIP REPORT (SARBYRPT.08 file)

CC: EMAD ABDEL RAZEK

OBJECTIVE: to have a meeting to ask the many questions and speak with a respected Egyptian Agri-business leader, and to have his valuable input as to what priorities we should look towards, how/who/where we can source the needed information to accomplish the strategic business planning.

BACKGROUND: (see RXB files as below):

EGYPTMKT with five major topics areas
PUNCHLST with apple, peach and grape questions/list
SARBYLS.,08 with 7 major topic agenda schedule

RESULTS OF MEETING

1.00 Concerning the Egyptian exportation of fresh agricultural products:

1.01 Negative issues holding Egypt back:
- Poor overall product quality
- Poor packaging design and quality
- Poor grading-sorting infrastructure
- Lack of standards for produce grading quality
- Lack of *transport infra-structure for all agriculture

RICK. WHO CAN TELL US WHAT THE REAL ISSUES & PROBLEMS MIGHT HAVE BEEN?

1.02 Unofficially, Egypt has a 6 to 7 billion dollar negative balance of payment for agriculture. Some agricultural products are exported, but no one has done much to set Egypt up as a major exporter of fresh produce.

1.03 Potential fresh export markets:
- *Saudi Arabia and other Arab markets; but lack the transportation infra-structure to be effective presently,
- Europe and UK; but lack the *transport and the commitment to stay long-term with the markets.
- C.I.S. offers a lot of future potential, but due to the many present problems, TDC AND EEEP should concentrate on Arab and EC markets, and then

* RICK. TRANSPORT & ASSOC' COSTS ARE ISSUES WE NEED TO DISCUSS. POSSIBLY - NEED TO KNOW WHO THE MAJOR SEA CARRIERS ARE;
- THE AVAILABILITY / COSTS FOR REFRIGERATED CONTAINERS
- MORE ABOUT GERMAN OR DUTCH "NEW" CONTAINER (TEMP, O2, CO2 + ETHYLENE REMOVAL)
- WHAT DOES IT TAKE TO GET BETTER & CHEAPER SEA FREIGHT.
- HOW LIMITED IS AIR FREIGHT, WHO ARE RELIABLE FREIGHT CARRIERS COSTS, ETC.

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possibly consider moving into the Eastern Europe target markets before considering Russia and other CIS markets.

1.04 Highest priority fresh crops to start with
- grapes
- potatoes

1.05 Highest priority crop strategy--need to pull away from those agricultural crops that do not provide the higher returns per acre and move into those that will. Eg: move away from wheat and barley into vegetables (potatoes were stressed) that will turn several crops per year of high returns.

1.06 Egypt has many excellent and important features in its favor, e.g.: abundance of irrigation water; 350 days of bright sunlight, 350 days without frost which all translates to an almost continuous growing season. However, in the past 2 to 6 decades no one has put a program together to capture all these positive features and to come up with a sound program to export good quality agricultural products.

2.00 Concerning Egyptian exportation of processed agricultural products:

2.01 Negative issues holding Egypt back:

- Poor quality of processed merchandise
- Poor packaging quality and design
- Poor (or lack of) processing facility and technology
- Poor distribution (lack of transport infrastructure)
- Farmer/grower problems (many)
- Supply problems/Wrong varieties used

2.02 Understanding of Private and Public Sector Food Processing facilities: A high percentage of processed foods are manufactured by the Public Sector (S.O.E.), and the products are intended for domestic consumption. there doesn't seem to be a lack of supply of raw materials input nor finished goods. However, the Private sector industry has been small and often faces many supply problems, financial problems and other problems.

Note: Emad has the names of several companies, the

officers and the products produced so we can make contact and appointments to discuss the future and possibilities.

- Montana Co (Frozen Processor)
- Aga Co (Owned by Nile Bank)

2.03 Potential markets for exports:

- Arab markets
- Europe and UK
- Eastern Europe
- Africa
- Others (?)

RICK - NO ONE YET WAS TALKED OF NEED TO FOCUS ON GRAPES FOR EXPORT; ONLY FOR POSSIBLY FRESH AND UNTIL TRANSPORT ISSUES ARE SOLVED WHAT MIGHT WE CONSIDER OTHERWISE?

2.04 Highest priority Crop Strategies for export considerations:

- Peaches
- Processed potatoes (mentioned frozen french fries)
- REB OPINION--need to consider Processed Apple slices and othr evaporated apple and fuit pieces.

2.05 Crop priorities to concentrate on:

- Avoid short-term work involving citrus. All the citrus groves are old and really need to be replaced with new trees and modern growing/farming culture techniques.
- Bring in the North American Seed potato varieties needed to produce the crops with the desired quality attributes and sell the seed to the growers.

RICK - WE NEED INFO SESSION TO KNOW DETAILS OF OLD & NEW AREAS, WHERE, WHAT ISSUES/PROBLEMS -

- Consider those growing regions away from the population centers (Cairo, and Alexandria) to avoid the farmer to move crop to retail consumers.
- Contract with the growers for quantity and price

3.00 Other comments:

3.01 Many of the Egyptian processing firms have modern facilities with good technology. A big problem is the scheduling of crop deliveries to avoid having too much to process within a 24 hour period. Note: we need to schedule possible appointments to have discussions and see their facilities for future planning.

SUCCESS STORY STILL IS LONG WAY FROM BEING WRITTEN — WHO CAN TELL US THE REAL FACTS/ISSUES THAT HOLD THEM BACK - TOMATO ISSUES ARE HIGH THEY CONTINUE TO IMPORT T. PASTE - WHAT SURPLUS CAPACITY MIGHT THEY HAVE

3.02 Many International Food Marketing companies have already established operations in ~~Egypt: e.g.: H.J.~~ Heinz, Knorr Soup and others (?).

3.03 The Egyptian apple growers are still making good returns on their investments: They were getting 10,000 LE per acre, but they are now getting 7 to 8,000 LE per acre, and are making profits at this level. PROCESSED/RAW APPLES MIGHT BE EX PENSIVE ?

RICK — WHAT WE HEARD DOESN'T TELL THE STORY THAT THEY ARE HURTING, NOT AS BAD AS OTHER VEG/FRUIT FARMERS?

The Peach growers don't make as much per acre (about 4,000 LE per acre), but still better than farmers who grow wheat, barley and corn.

HOW CAN WE SUMMARIZE ALL THESE IDLE LANDS AND CLASSIFY THEIR POTENTIALS AND WHAT/HOW TO MOVE ON THEM?

3.04 There are several (many) growing area that are under utilized. One such operation mentioned has 4,000 acres, but only 1,500 acres is planted in apples, the rest is fallow since they don't know what to grow. (Note, we don't know who/where it is located, but do know that it is owned by the Nile Bank).

3.05 It is expert opinion that TDC/EEEP should focus on those potential farms that have size/magnitude to capture scales of economy through mechanical farming and fewer growers to deal with. Stay away from those with less than total of 40 acres due to having only 10 acres of crops per type due to crop rotations.

4.00 The following is list of Food Processing companies in Egypt, (Chamber of Food Industries, Federation of Egyptian Industires, 1992)

- EDFINA COMPANY FOR PRESERVED FOOD/Public Sector, Canning & Freezing of vegetables, fruits & Fish, Mostafa Kamel Street, El-Ras-Souda, Alexandria, Tel 879017, 874300, Fax 879017.

- EL-MOTTAHEDAOUN TRADING & COOLING CO, "KHODAR EL-NIL, Private Sector, Vegetables preparation Freezing & Packaging, Abdel-Moniem Riod, Belbeis, Sharkia.

- EL-WADU AGRICULTURAL CROPS EXPORTING COMPANY/ Public Sector, Preparation of agricultural crops (citrus, onions, garlic, peanut), Dehydration, Fruits & Citrus Sorting, graduation & packaging, Sorting of Fresh onions.

- GEVREX COMPANY, Private Sector, Preparation, Freezing, packaging & Storing of Fruits, Vegetables and Fish, 83, Semouha Street, Sidi Gaber, Alexandria, POBox 747

- PORT SAID DEHYDRATION & FROZEN VEGETABLE FACTORY, Dehydration & Freezing of vegetables, Ard El-Senaat El-Khafifa, Kabouti, Port Sid, POBox 814, Tel 2114, 25714.

- POTATO GROWERS CO-OPERATIVE/Cooperative Sector, Poato Seeds Storage and marketing, 101 A. KASR El-Aini Street, Cairo, Tel 986443, 841950.

- FLAMENCO FOOD MANUFACTURING & TRADING COMPANY/Private Sector, Products: Processed Corn & Potatoes, 41, Beirut Street, Holiopolice Cairo.

- EL-WATANIA FOOD SECURITY COMPANY/Public Sector, Processing, packaging & storage of Food Stuffs, 8 Midan Talaat Harb, Cairo, Tel 3928125.

- EL-NASR COMPANY FOR DEHYDRATION OF AGRICULTURAL PRODUCTS/Public Secor, Dehydrated onions, garlics, and vegetables, 4, Maurof Street, Cairo, Tel 756270, 758755.

- EL-ETTEHAD ICE & COOLING COMPANY/Private Sector, Ice, Potato Seeds Storage, 38, EL-Moahida Street, Kafr El-Zayat, Tel 2894.

Kick.

September 12, 1993

TO: ALY NARSAT

FROM: ROY BOSLEY (RXB)

SUBJECT: TDC APPOINTMENTS (FILE TDCCONTS.12)

We need to try to set up appointments with the following companies to gather base line data and understandings of the respective companiees.

1. UNITED CO. FOR FOOD INDUSTRIES S.A.E. (MONTANA)

   Address: Kilo 24 Cairo/Alexandria Agriculture Road; Qalyoub, Egypt.

   Tel: 957245 - 957139
   Fax: 3482859

   Contact: Mr Heydi Miaamiun, Chairman

   Products: **Frozen vegetables: Okra; Molokheya; spinach; artichoke; green peas; green pea/carrots; mixed vegetables; cauliflower, colcas; green beans; vine leaves; falafel; potatoes; carrots.**

   Frozen fruits: strawberries, mallow.

2. PLANT PRODUCTION COMPANY

   Address: 33 El Nakhil Street, Mohandessen, Cairo, Egypt.

   Tel: 709778 - 717459
   Fax: 3603272

   Contact: Engineer Ahmed Nassar, Chairman

   Products: **Fresh vegetables: Baby cucumber, green sweet pepper, Iceberg lettuce, broccoli, tomatoes.**

   Pickles: Baby cucumber.

   Fresh fruits: Watermelon, cantaloupe.

   Frozen vegetables: Broccoli, Burssel sprouts.

3. PICO

Address: 3 Shagaret El Dorr Street, Zamalek, Cairo, Egypt

Tel: 341478 - 3415915
Fax: 02 3412409

Contact: DR. Kamel Diab, President

Products: **Fresh vegetables: green beans; asparagus; chinese garlic; potatoes.**

Fresh fruits: Seedless grapes, peaches, nectarines, strawberry.

Frozen vegetables: Broccoli, Brussels sprouts.

4. GIZA SEEDS AND HERBS S.A.E.

Address: 7 Lazoghly Street, Isis Building, Garden City, Cairo, Egypt

Tel: 3549400

Contact: Mr Karim Badrawi, Export Manager

Products: **Dehydrated vegetables: Onion; carrots; Garlic; Tomatoes; Spinach; Turnip; Bell perper; Beet root; green onion; Green peas; Leeks; Cabbage; Potatoes; Caulilflower.**

5. EGYPTIAN FRUITS COMPANY "BEST"

Address: 157, 26 th July Street, Zamalek, Cairo, C.R. 114962

Tel: 3404408

Products: **Preserved Fruits - Juices.**

6. EGYPT TRADE COMPANY "CHIPSY'

Address: 4, King Faisl Street, Haram, Giza

Tel: 700248

Products: **Potato Slices (Chipsy)**

7. EL - MOTTAHEDAOUN TRADING & COOLING COMPANY "KHODAR EL - NIL"

Address: Abdel-Moniem Riod, Belbeis, Sharkia

Tel:

Products: Vegetables, Preparation, Freezing and Packaging

8. FLAMENCO FOOD MANUFACTURING & TRADING COMPANY

Address: 41, Beirut Street, Holiopolice, Cario

Tel:

Products: Processed Corn & Potatoes

9. GEVREX COMNPANY

Address: 83, Semouha Street, Sidi Gaber, Alexandria, P.O. Box 747

Tel:

Products: Preparation, freezing, packaging & storing of Fruits, vegetables, and fish.

10. ISMAILIA EL-WATANIA FOOD INDUSTRIES COMPANY "FOODICO"

Address: 7, Horreya Street, Midan El-Keyada El-Moshtraka, Holiopolice, Cairo.

Tel: 2901909

Products: Land reclamation and cultivation, Frozen Vegetables

11. KAMENA PRODUCTS CORPORATION "MEDHAT ISKANDER"

Address: 16, Mahmoud Basiouni Street, Cairo, Egypt

Tel: 754511, 754652

Products: Juices and Canned Products

12. MANZALA FOOD INDUSTRIES COMPANY

Address: 27, Abdel-Khalek Tharwat Street, Cairo

Tel: 3924432, 3936306

Products: Dehydrated onions and garlics

13. PORT SAID DEHYDRATED & FROZEEN VEGETABLES FACTORY

Address: Ard El-Sennaat El-Khafifa, Kabouti, Port Sid

Tel: 2114, 25714

Products: Dehydration & Freezing of vegetables

14. Aga Company--owned by Nile Bank

No further knowledge of where to contact. Reference furnished by Mr Ismail Sabry as one we should contact.

14. I was told there is an American company dehydrating vegetables somewhere in Egypt. Reference furnished by Mr Ahmed Nassar during my interview with him

Roy Bosley

Rick - FYI & comments — RAB

September 13, 1993

SUBJECT: POTATO SEMINAR WORK-UP **DRAFT ONLY**

Estimated presentation time:

20 minutes per topic x 16 topics = 5.33 hours

1. RAW POTATO VARIETY SELECTION:
   - Dutch---possibly for European and Middle East "European A grade french fries". Depending on economic costs compared to North American seed, it needs to be evaluated to know if these could be processed into dehydrated products.
   - North American--needed for McDonald's and major chain frozen french fry business

   NOTE: The N.A. long white potatoes have considerably higher potato solids and less moisture. The solids are a key aspect in having both good financial returns from the facility as well as to have the right texture and cooking qualities in both the frozen and dehydrated products.

2. FARM INPUTS:
   - Quality seed potatoes in F4 or foundation class;
   - Nitrogen, Phosphate, and Potassium at the optimum levels and being applied at the proper time to capture the maximum efficiencies for nutrient feeding the plant;
   - Insecticides to control, and to capture the maximum tonnage and plant vigor to deliver high tonnage of the right sized potato tubers:
   - Fungicides of the right type, the right time, with good applications to reduce the risks of early and late blight;
   - Herbicides to be applied to reduce the needs of excessive tillage/cultivations;
   - Irrigation, to be able to maintain greater than 65 percent available soil moisture at all times to avoid stressing the plant.

NOTE: The above six statements are most crucial to grow the potato crop to achieve the maximum tonnages and sizes. If any of these elements are lacking, it costs the farmer in the pocket book in terms of tonnage and premium incentive payments from the processor.

3. PROPER CROP ROTATIONS:
   - Potato--grain--grain--potato--etc.
   - Potato--grain--peas or beans--potato--etc.

NOTE: When farmers start growing potatoes back to back it becomes very risky that the soils will/can be contaminated by viruses, fungi, bacteria. These can cause the farm to be canceled out to grow potato crops for many years unless the soils are sterilized, or fumigated.

4. MULTIPLE CROPS PER YEAR VERSES ONE CROP AND THEN BE STORED:

The economic justification need be considered as to whether it is better to pull from different areas within a year to feed a potato processing plant, or if it would be better to select the proper growing area and plant only one crop and then place the total crop into an environmentally controlled potato storage building.

5. FARM SIZE:

To operate a small potato processing facility to produce the frozen french fries or to make dehydrated potato products, a supply of approximately 32,000 metric tons of potatoes will be required for a single fry line with 2 metric ton per hour (13,500 metric tons per 300 day process year) capacity.

It is extremely difficult to operate the facility and maintain the control of product quality if the supply of raw potatoes come from considerable numbers of farms. In addition, it is also difficult to schedule the preperation of seed & delivery, the planting, and importantly the chemical spraying, plus the harvest and transport of the raw crop from many farms into the process storage and or the process facility.

6. FARM MECHANIZATION:

Since the process facility will require 32,000 metric tons per year, **then 32,000 tons x 1,000 kg / 15,000 kg (per acre) = 2,134 acres of farm land to be farmed** to support the frozen fry line processing facility.

This assumes the average potato farm yield is 15 metric ton per acre.

Considering the needs to get the seed potatoes planted in a short time period it would be economically to have a good portion of the farming practices be done by mechanization.

Mechanization to include: plowing and land preparation; seed planting; cultivation; farm chemical spraying; and harvest.

7. FARM TRANSPORT:

With the tonnages of crop to be transported to storage/facility it will be necessary to have adequate, reliable farm transport to quickly move the crop out of the heat.

Careful handling of the potatoes is paramount to avoid bruising the potatoes. If a potato is dropped more than 4 inches it will be bruised, and this leads to potential rot and tuber tissue that cause" black spot" defects that must be removed, all of which is expensive.

8. HARVEST AND POST HARVEST:

Mechanical harvesters (combines) must be of major considerations. The crop size, the possible heat, the possible excess handling and bruising are of serious economic losses.

Potatoes harvested in warm climates have field heat that must be taken away under prescribed temperature reduction schemes. If potatoes are to be stored, then they must be stored under

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the right temperatures, the right humidity, and the right amounts of air flow to achieve a stable-steady resting state. If they are not stored properly they will respire, and the respiration removes water and potato solids, all of which become economic factors of great magnitude.

Under proper environmentally controlled conditions, potatoes can be put into storage for 11 to 12 months and experience only two to three percent shrink loss.

In addition, if potatoes are placed in commercial cold storage to keep for periods of time, the tubers will accumulate high levels of sugar. The presence of sugar in the potato tissue cause browning during the processing, and is an undesirable feature.

9. POTATO CROP AVAILABILITY & DEDICATION TO THE PROCESSOR:

If a country has the ability to multiple crop potatoes within a calendar year, and if the economic studies indicate that the crop quality, the tonnages are right, and that transportation costs justify using fresh without competition from the fresh table ware markets, then it is justified.

If a farmer makes the commitment to grow for the processor, then both the farmer and the processor have ethical and legal reasons to develop good relationships. The farmer must make suitable profit as does the processor. In addition, the costs and selling prices of the finished goods must be competitively priced in the International marketplaces.

10. POTENTIAL PROCESSED POTATO PRODUCTS:

- Frozen french fries
- Frozen potato products
- Dehydrated potato slices and complete sauce mixes
- Dehydrated potato flakes
- Fried potato snacks, chips or sticks

11. POTENTIAL EXPORT MARKETS:

- Northern Europe
- Western Europe
- Southern Europe
- Middle East
- Africa
- Eastern Europe

12. CROP COST AND FARM GATE PRICES:

- What is the break even price plus a percent mark up?
- How to arrive with formula for farmgate price?
- How to derive a suitable contract and price?
- How to develop the mutual trusts for delivery of crop?

13. MANUFACTURING INPUTS:

- Potato Seed
- Fuel, power, water
- Frying shortening
- Packaging materials
- Labor pool
- Imports

14. MANUFACTURING OUTPUTS:

- Waste solids to be fed to cattle
- Waste water that must be irrigated on agricultural fields
- Finish goods
- Providing many direct and indirect jobs (employment)
- Bring back hard currency

15. PRODUCTION EQUIPMENT:

- For a 13,000 m ton frozen french fry facility it will cost in the range of $ 7 million (US); with capacity of 2.0 metric ton per hour of finish frozen french fries.

- For a 2,000 m ton dehydrated flake facility it will cost in the range of $3 million (US); with a capacity of 386 kg per hour of finish dried (7.0 % moisture) potato flakes.

- For a 2,000 m ton dehydrated slice facility it will cost in the range of $3 million (US): with a capacity of 327 kg per hour finish dried (7.0 % moisture) potato slices.

- Any of the three configuration above will employ approximately 110 to 120 person per day.

- Any of the three configurations above need to be operated 24 hour per day, 12 of 14 days continuous running time.

16. SEED POTATO QUALITY:

- It is paramount that clean, disease free and young potato seed be planted. It is poor practice to use previously grown commercial potatoes as seed as there is high probabilities of encountering diseased seed, and the vigor will dwindle and harvest yields will be reduced.

- Depending upon the cultivars that are found to be suitable for processed potato production in Egypt suitable for delivery into the international markets, the decisions of importing new foundation quality seed each year needs to be evaluated and compared with developing an Egyptian In-Country rapid seed potato development program. In addition, Egypt must ensure that they have a solid seed certification in place and workable.

17. SEED POTATO REQUIREMENTS:

- ASSUMPTIONS:

  - FRENCH FRY PLANT NEEDS,
  - 32,000 METRIC TONS RAW NEEDED, LESS 5% TARE WILL EQUAL 30,400 METRIC TONS USEABLE FOR FRY PLANT,
  - EGYPTIAN POTATO FARM LAND WILL YIELD 15 METRIC TON PER ACRE,
  - 2,134 ACRES OF LAND REQUIRED TO GROW OUT THE COMMERCIAL CROP (32,000 METRIC TONS),
  - FARMER WILL PLANT 1,00 KG SEED POTATO PER ACRE.

- THEN--(2,134 ACRES X 1,00 KG)/1,000 = 2,134 METRIC TONS

18. IN-COUNTRY RAPID POTATO SEED DEVELOPMENT PROGRAM CONSIDERATIONS:

- **start with mini tubers to produce F 1 tubers**
  0.2625 ton x 10 x .95 useable = 2.49 tons @ F 1

- **grow out F 1 tubers to produce F 2 tubers**
  2.494 tons x 10 x .95 uesable = 23.69 tons @ F 2

- **grow out F 2 tubers to produce F 3 tubers**
  23.69 tons x 10 x .95 useable = 225.05 tons @ F 3

- **grow out F 3 tubers to produce F4 tubers**
  225.05 tons x 10 x .95 useable = 2,138.00 tons @ F 4

- **grow out F 4 tubers to have commercial crop**
  2,138 tons x 15 x .95 useable = 30,466.5 tons for fries

Kato

TS

TRIP Report from R-7 Bosley (Mr. Donald French Fry Guy) KK

September 29, 1993

SUBJECT: TRIP REPORT, FARM-FRITES, A FROZEN POTATO PROCESSING CO.

On September 28, 1993 JR Miller and RE Bosley visited said facilities at 10 th of Ramadan, Egypt for a meeting with Mr Tarek Z Tawfik (Gen. Manager) and Mr Walid El Hennanay (Export Manager). The purpose of the visit was to: 1) review their agriculture program (potatoes), 2) review their processing facilities, 3) review their post harvest potato storage program, 4) review their Quality Assurance program, and 5) review their export customer base and export opportunities.

The following narrative will describe what-how-where TDC could impact the positive cash flow for FARM-FRITES if they were to agree to such a program:

1.00 AGRICULTURAL ISSUES

1.01 Seed Selection: the company presently maintains their raw material base by using Diamant, Baraka and Cardinal potato varieties. All three are Dutch, and while suitable for table-stock cooking potatoes they are not best suited for making into commercial frozen french fries. They generally have potato solids content ranging from 16 to 19 percent. Lower potato solids cause problems in two ways:

a) Frozen french fries produced from low solids potatoes on refry cause high percentages of limp french fry units. This is a critical quality problem according to most buyers of frozen french fries, especially fast foods types of operations. If products exhibit high percentages of limp units, they cannot command higher market prices and must fight for market share on price and not quality buyers. Quality products can always be sold in all established markets.

b) To achieve the desired final texture in the finish product the frozen product must have been reduced in moisture content to a range of 64 to 70 percent depending upon the customers specifications. Most fast food operations require a frozen moisture content of approximately 64 percent. If the fresh potato started at 83 percent (17 percent solids) it will require more weight loss removal(energy consumption) during the drying and or frying to achieve the desired frozen moisture. If the potato started at 78 percent moisture (22 percent solids) it will require less weight loss to achieve the 64 percent moisture level. The difference between 17 percent verses 22 percent solids is that the 17 percent potato will be reduced in weight by approximately 22

percent more than the higher (22 percent) solids potato.

In addition, Farm-Frites have been unable to grow the tonnages required to operate the facilities for 300 days per year.

What this means to Farm-Frites:

- Since they are only producing approximately 11,000 tons per year of merchandise and with 52.5 percent recovery, they should be purchasing 20,952 tons of potatoes and will lose 19 kg of water per 100 kg of raw product produced; where-as the 22 percent potato will only give up 15 kg of water per 100 kg raw product input. Hence, if they are selling 11,000 tons x 0.22 x $750 per ton = $1,815,000 more sales with no additional direct variable costs other than the additional packaging and package labor.

- If the factory were to operate at 21,000 tons output per year with higher solids potatoes, then TDC could see: **21,000 tons x 0.22 x $750 per ton = $3,465,000 more sales with no additional direct variable costs other than the additional packaging and packaging labor.**

TDC NEW SALES & FARM-FRITE SAVINGS----$3,465,000 PER YEAR

c) Hence, if TDC were able to influence the ability for Farm-Frites to source and import North American (New Brunswick, Canada) potato varieties with higher potato solids, they would earn more sales revenues on the potatoes grown in Egypt. In addition, additional qualitative factors would be positively influenced by this move since they would have a product pack with higher percentage of over 3 inch (> 75 mm) in length and a better pack than the competition.

d) **Further savings could be achieved in that higher potato solids will require some 17,278,000,000 BTU's less in boiler fuel energy to evaporate the water either in the dryer and or fryer.** However, at this point in time I cannot compute the savings in boiler energy for lack of information.

FARM-FRITE SAVINGS 17.278 BILLION B.T.U's per year

1.02. COST OF DUTCH SEED VERSES NORTH AMERICAN SEED

a) It was reported they pay $350 per ton C.I.F. for the Dutch seed. It is believed they could purchase NA seed

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for $250 per ton C.I.F. a savings of $100 per ton on all seed imported. This would be a 40 percent reduction in cost of seed imported.

-b) Based on inputs, they use: 90 cm row widths, at 30 cm seed drop spacing, and they should have 17,750 plants per acre (44,375 plants per Ha). Assuming they use on average a 2 oz (56 to 60 gram) seed they should be planting ((27.2 cwts / 2,200 lb) x 2.5 = 3.090 ton/Ha, or 1.236 ton per acre, which is in line with verification from the company statements.

-c) Assuming under present conditions they get 25 ton per ha yields and their needs are 40,000 tons total for the fry business per year. Then 40,000 / 25 ton = 1,600 Ha of land (4,000 acres) need to be planted.

-d) Since they get two crops per year from the one importation, then they should be importing (4,000 acres x 1.236 x .5) = 2,472 tons of imported seed per year. **If there is a $100 per ton saving, then $100 x 2,472 tons = $247,200 per year could be saved by importing NA seed potatoes.**

FARM-FRITE SAVINGS $247,000 PER YEAR

1.03 FARM PRACTICES (IRRIGATION)

1.03(a) Basically they are over watering (irrigating) the potato crops judging from yesterday's observations. There are six potential savings that could be realized, but hard at present time to put dollars to until more in-depth studies were conducted:

-too frequent and too much water forces the fertilizers (N,P,K) down below the root zone;

-the roots will not grown downward to reach these descending nutrients since there is more than enough water to become "lazy", hence the plants begin to starve from lack of nutrients;

-too much water in the root zone precludes the proper oxygen-soil balance, hence the plants begin to starve for oxygen;

-too much water allows the soils to compact, making tuber growth and development difficult;

-too much water enhances the opportunity for diseases to attack the roots and tubers;

-too much watering adds to the costs of pumping and running the center pivots and also the extra wear and tear to the machinery.

1.04 FARM PRACTICES (YIELDS OF COMMERCIAL CROPS)

This company has been getting yields of 25 to 28 tons per ha; where-as they feel they should be getting 30 to 45 tons per ha. Several issues can affect the yields of potatoes:

-Day lengths
-Fertilizer rates and the timing of applications
-Irrigation schedules
-Row and seed drop widths and spacings
-Diseases, and degree of seed potato quality

Until a more detailed analyses can be performed it is not possible to accurately say what might be causing these reduced yields. It would probably take six to twelve months of continuous field work and some trials to fully understand the cause and effect relationships for Egypt.

1.05 POTATO UTILIZATION

a) The harvest of a commercial crop will produce small, medium and large potatoes, the percentages of each will vary according to the variety, the maturity of seed planted, the seed drop spacing and row widths, as well as the total fertilizer program.

b) It had been stated they were experiencing some fifty percent small tubers, and that they had tried two schemes to sell these unwanted tubers. One was to sell to exporters and the other has been to sell to local potato chip manufactures and the fresh table-stock markets. In more recent times they have lowered the percentage to approximately 30 percent, and this is about usual with any variety under normal growing conditions.

c) <u>What might be accomplished with TDC assisting Farm-Frites is to install a second process line to utilize these smaller potatoes to produce several by-products</u>. Dehydrated or frozen products could be considered; however, expert opinion would be to recommend targeting the specialty frozen potato products to be marketed. Frozen products such as: small boiler potatoes; IQF shredded hash browns, hash brown patties, or pre-formed potato nuggets; or frozen (fried or not) potato slices for pan or deep fat frying.

d) The following approach assumes that TDC could assist

and that Farm-Frites could reach their 40,000 tons of raw needed for the french fries, and that 40,000 tons represents 66 percent of the potato crop grown--40,000/.66 = 60,600 tons of potatoes would be grown. From this total, 20,600 tons of small potatoes could be available to be put into the plant to be produced into frozen by-products.

e) Assuming the facility running all year would operate 300 days, then 20,600 / 300 = 68.686 tons raw per day for the second production line.

f) Assuming 40 percent recovery of raw to finish, then 68.686 tons / 22.5 hours x .40 recovery = 1.221 ton per hour of finish product produced, or 8,200 tons per year.

g) Assuming the front end of the plant will handle the raw receiving, the peeling, and trimming and inspection, a rough ball park estimate that an American designed and manufacture processing equipment line could be delivered C.I.F. to Egypt for $2 million, and that another $500,000 would be required to install this equipment. **If the sales of this 8,200 tons of product could be sold at $750 per ton, then 8,200 x $750 = $6,150,000 new sales per year.**

NEW EXPORT SALES OF $6,150,000 PER YEAR

If an order were placed with an American firm early October it is possible the line could be installed and ready for production in early summer, 1994.

Not knowing the variable cost of manufacture in Egypt for such a product it is not possible to calculate the potential profits this line would contribute.

2.00 PROCESSING FACILITIES

2.01 Plant Sanitation: The facilities had been shut down for several weeks. They had performed a clean up; however the equipment was not clean. This is symptomatic of weak management and probable cause for customer complaints. TDC consultant could assist in pland sanation.

2.02 Cutter Efficiencies: It was stated they experience 18 to 20 percent sliver and trash generated from their water cutting knives. The Dutch manufacturer of equipment has not done a proper job of design for these cutters. They should only experience five to seven percent sliver and small piece from these cutters. **What this is costing them is: (.20 - .07 = 13 percent could be saved. If at 21,000 tons capacity, a 13**

percent increase in output could mean: (21,000 tons x .13 x $750 = $1,950,000 additional sales increase.

NEW EXPORT SALES PER YEAR $1,950,000

3.00 POST HARVEST STORAGE

3.01 They grow two potato crops per year, and for three months of each cycle they are able to pull potatoes directly from the fields into the process plant. For the balance of the three month cycle they must have put harvested potatoes into some form of storage. They use a sun sheltered roof type building with no forced air, no humidity added, nor cooling to store these potatoes for the three months.

- It was reported they lose 10 percent of the stored potatoes per cycle.

3.02 Assuming the crop is 40,000 tons per year for just the french fry needs and is double cropped, then they need ((40,000/2)/2) = 10,000 tons of storage per cycle for fries.

- Assuming that they would proceed with plans to produce products from the small potatoes, then they would need storage for these small potatoes:

  - Assuming 20,600 tons per year and double cropped, then ((20,600 /2)/2) = 5,000 tons of storage for each cycle for the new products line.

3.03 Computing the costs of these loses per year is shown to be: ((10,000 tons + 10,000 tons + 5,000 tons + 5,000 tons) x .10) x $150 = $450,000 per year from rot and shrink in their storage.

- It was stated they are evaluating putting in a controlled environment post harvest storage and they have an estimate of $700,000 for a 4,000 ton storage. It is possible that an American company could deliver the storage for $125 per ton, and for 15,000 tons x $125 = $ 1,875,000 they can save:

  - By buying American technology and equipment for $125 per ton verses $175 per ton (as noted above), they can save on 15,000 tons total storage: **$50 x 15,000 tons = $750,000**

FARM-FRITE SAVINGS ON SINGLE PURCHASE $750,000

-Present losses =$450,000; U.S. storage units cost $1,875,000, the life of the storage would be 25 years, then:

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- the savings would be computed:
($125 x 15,000 ton)/$450,000 = payback of 4.17 year and overall for the 25 year life of building-- (25 - 4.17) x $450,000 = $9,373,500; however, put on annualized basis = $374,940 each year for the next 25 years. $374,940

FARM-FRITE SAVINGS ~~$425,000~~ PER YEAR

- Aside from the savings of shrink, several other points need to discussed, these being: **Since any bruise, or cut will cause a defect on the tuber flesh, considerable labor will be needed to trim away these defects, rot and or blemishes. Hence with less rot and defects coming into the plant less labor will be required to remove these defects** However, it is not known at the present how much this savings might be.

FARM-FRITE LABOR SAVINGS---?????

If an order were to be placed with an American firm early October, it is possible that the facility could be in place and ready to receive potatoes sometime in May, 1994.

4.00 QUALITY ASSURANCE

4.01 We had insufficient time to fully understand what went on in their QA laboratories; however, it was apparent they have a loosely run operation.

a) It appears they do not grade the fried texture of the french fries, and do not consider texture and percentages of limp units.

b) The format of the QA records are very shallow, and it was observed in one situation they were averaging averages, which is a no no!!

5.00 SALES AND CUSTOMERS

5.01 Lacking sufficient raw tonnages to operate the facility to design capacity all through the year this limits the sales velocity considerably. They have stated they only run the operation approximately fifty percent of the capacity.

- 21,000 tons x .50 = 10,500 tons of new sales capacity that TDC could find new customer for them. If sales were $750 per ton x 10,500 tons = $7,875,000 new sales.

NEW FRENCH FRY EXPORT SALES $7,875,000

5.02 If TDC is able to demonstrate that a second line to produce new products if viable and justifiable, then additional sales could be

46

- 20,600 tons raw x .40 x $750 = $6,180,000 new sales

NEW PRODUCTS EXPORT SALES $6,180,000

5.03 Since Farm-Frites have indicated McDonald's have been in to inspect the facilities, and are being considered a potential supplier, then probably 6,000 tons of the added new production could be targeted to McDonald's for export sales. This probably could be sold for $954 per ton, and hence, **$954 x 6,000 tons = $5,724,000 for McDonald's;**

4,200 tons x $700 = $2,940,000, or combined from french fries this would total $8,664,000 (+/-) $500,000

5.04 For the 8,240 of specialty frozen by-products, it would require due diligence work to determine what quantities for what markets for what products.

5.05 TDC could also provide Sales-Marketing support to assist Farm-Frites how to know their products, and how to aggressively cut their products against competitio

SUMMARY OF TDC INFLUENCE TO ASSIST FARM-FRITES:

EXPECTED DIRECT SAVINGS TO FARM-FRITES

1.01(b)	Using North American High Solids potatoes	$3,465,000 per year
1.01(d)	Fuel and energy savings	17.278 billion B.T.U's
1.02(a)	Post harvest storage savings	$374,940 per year
3.03	Investment savings on 15,000 ton storage	$750,000
	Fuel savings on higher potato solids	?
	Trim labor savings	?
	Fixed & semi-fixed costs savings	?
	ESTIMATED SAVINGS TO FARM-FRITES	**$4,589,940**

EXPECTED NEW EXPORT SALES FOR FARM-FRITES BY T.D.C.

1.05 Adding new products for export sales	$6,150,000
2.02 Added sales by better cutter efficiencies	1,950,000
5.01 Additional new export french fry sales	7,875,000
5.03 Assisting Farm-Frites to get McDonald's	?
ESTIMATED NEW EXPORT SALES FOR FARM-FRITES	**$15,975,000**

U.S. EXPORT SALES TO EGYPT

Sale of 15,000 ton Post Harvest Storage	$1,875,000
Sale of 1.2 T/hr frozen product equipment line	2,000,000
ESTIMATED U.S. EXPORT SALES TO EGYPT	**$3,875,000**

NORTH AMERICAN EXPORT SALES OF POTATOES TO EGYPT

2,500 tons per year x $250 per ton	**$ 625,000**

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Appendix: Egyptian Processed Potato Project Evaluations

EGYPTIAN PROCESSED POTATO PROJECT EVALUATIONS

The following questions are raised so that all parties to the solution of the Estonian processed potato project can be provided with the most detailed answers that will lead to the completion of the best available knowledge information that can and will be used to drive the complete strategic and tactical business plan.

1. What is the business? _____

2. Who are the indigenous owners of the proposed project? _____

3. Provide financial background & details of each owner _____

4. Describe all products & tonnages to be produced at the proposed production facility

5. What labels (house labels, private labels)? _____

6. What markets are to be served (foodservice, industrial, retail, Chain buyer)?

7. What are annual kg or tons per product per market per customer?

8. What sizes of packages/products? _____

307 Windsor Drive, Caldwell, Idaho 83605 USA Telephone (208) 459-4102 Fax (208) 459-1253

9. Describe how/where, and conditions, that all finish product will be stored.

10. Describe where frozen product will be stored, the conditions, costs, etc.

11. What distribution system (s) exist to distribute products to customer?

12. What limiting factors will impact the distribution of the frozen potato products, and the potato chips?

13. Who are the proposed customers (identify all in detail) for all the products?

14. Provide anticipated monthly sales kg & value for each product (by customer) for the years: 1, 2, 3, 4, 5.

15. Provide the plans for cash flows for the above years, based on best estimates available.

16. Provide best estimates for production capacity of the machinery at the proposed site.

17. What are the known or estimated "choke or limiting factor points" of each production line?

18. How many days does the existing facility run: per week, per month, per season?

19. What are the known limiting choke points that will not allow the facility to operate longer?

20. What are the estimated total potato tonnages required to operate all proposed processed potato lines if the lines were to operate 300 days per year, 24 hours per day?

21. How many tons of harvested potatoes can be stored in actually constructed and operating potato warehouses?

22. How many days during potato harvesting can the potatoes be brought directly from the fields to the processing site and produced without being put into storage?

23. When does the potato harvest usually start and when does it end?

24. How many hours per day does the actual harvest and transport of potatoes operate?

_____

_____

_____

_____ (reducing crops harvesting periods / mulch?)

25. Describe the past 10 year weather & temperatures from August to December in the region.

_____

_____

_____

_____

26. What potato varieties are available & tonnages of each from the regions farmers?

_____

_____

_____

27. Provide the past 5 years historical costs of potatoes to the farmers.

_____

_____

_____

_____

28. Provide historical record of potato quality:

What potato varieties are available, describe in detail?
What periods of time are the commercial potatoes available?
What prices are paid the growers at different times of the year?
Do the farmers belong to cooperatives or unions?
Describe for each variety the following:

% 0 to 113 gm._____ Length per unit this class_____
% 113 to 170 gm._____ Length per unit this class_____
% 170 to 283 gm._____ Length per unit this class_____
% > 283 gm._____ Length per unit this class_____

Average solids 16 to 19 %_____
19 to 21 %_____
21 to 24 %_____
>24 %_____

-Average percent reducing sugar_____
-What shape--Round?_____ Oblong?_____ Rectangular?_____
-How deep are the eyes: Shallow?____ Medium?____ Deep?_____
-Describe the potato skin and thickness (thin_____, Medium_____, Heavy_____)
-Describe all known and possible potato & soil diseases, viruses, blights, and insects that can and will cause damage to the potato plants and their tubers. _____

_____

_____

_____

_____

_____

_____

Describe the skin: color_____, netting_____, susceptible to skinning_____
Describe the potato flesh: color_____,flavor_____, susceptible to after cooking darkening?_____, texture after cooking (wet____, waxy____, dry & mealy_____)

29. Describe farm cultural practices:
What seed used?_____ From where?_____ Cost?_____
How is seed stored?_____ Prepared for planting?_____ Planted?_____
When planted?_____ When harvested?_____ How harvested?
How irrigated?_____ Is ground water, rivers available?_____
What is seed drop space?_____ At what depth planted?____ Width of rows?
What varieties are available & used? At what costs to farmer?
What amount of fertilizers used?_____ When applied?_____
What insecticides used & when/how applied?_____
What herbicides used & when/how applied?_____
What fungicides used & when/how applied?_____
What choke points exist to have modern farming practices?_____
What can government agencies do to supply assistance?_____
What duties exist to import things not found in the country?_____
What availability and shortages exist on any of the above?_____
How many generations of potato re-use are practiced with the potato seed?_____
Can the growers supply a detailed farming costs showing their total costs for crop?
What yield per hectare do farmers get for potatoes? Self grown____ Others_____
What size are the farm fields? Self grown_____ Others_____
Describe mechanization on farms: Self grown_____ Others_____
Describe all farm chemicals available, costs, producer:_____

Describe how potatoes are transported to storage or processing facility (What size loads, how loaded, type of transport, distance, costs, & who furnishes):
_____
_____
_____

Describe the various potato storages available, or might be useable, and the overall conditions of these storages as well as the operating procedures and conditions, as well as the quality of the potatoes coming from these storages throughout the year:
_____
_____
_____
_____

30. Describe the existing potato processing facility:
Type of construction_____
Age of facility_____
Raw receiving_____
Raw potato grading & surge bins_____
The boiler (steam) type, fuel, capacity vs known steam demands_____
_____
_____

The electrical sub-station, volts, KVA, cycles, and capacity vs known electrical demands:

Any rail distribution services? If so describe

Where would frozen potato inventories be maintained? Self owned
(Commercial storage, if so how much space, at what costs and where located)

Describe availability and source of natural, or bottled gas for fuel: Supplier
Costs per cubic meter BTu's per cubic meter Problems
Describe fresh water for facilities to use: Who supplies? What costs?
Purity for water hardness? Potable? Chlorinated?
Size of main line entering facility & pressure? L/min capacity?
Describe exit of "dirty process water" from the facility:

Describe government water quality standards for waste water discharge and what is or may be required to treat the spent waste waters leaving the processing facility:

Describe the roads, highways, leading into the area that the facility is presently located at:

Describe commercial transport for delivery of goods from the facility to:

* Local buyer of merchandise
* To sea port for export shipping describe all export markets if necc
* By land transport to countries such as Russia, Poland, Germany:
* Describe availability of 40 foot refrigerated Sea Containers at port
* Describe availability of 40 foot (HI CUBE) refrigerated TIR trucks
* Describe the costs and problems with any of the above:

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Describe the costs and availability for edible vegetable shorting to be used, and who is the supplier producer, and examine import duty costs for said frying shortening:_____

_____

_____

_____

Describe the costs, availability, and suppliers of plastic bags, paper stock and cardboard shipping boxes:_____

_____

_____

_____

Describe Labor and government, labor unions, local supply, crafts, etc.:

Government regulation:_____

Union activities:_____

Labor supply for men & women (24 hour days):_____

Wage paid per hour: laborers_____, technical or trades_____, management_____?

Benefits adding to over-all additional costs:_____

_____

_____

Describe Governmental regulations for waste disposal of process waters:_____

-Governmental regulations for safety_____

-Governmental regulations for air quality emissions_____

-Governmental regulations for fire insurance, etc._____

Describe the grounds at the facilities site:

-What is the location to nearest city?_____

-What is the size of land parcel?_____

-What % of total parcel has buildings on it?_____

-Topography of the land:_____

-Is electrical sub-station nearby (what distance from site)?_____

-What zoning and laws exists in the area of facility?_____

-Are truck scales located at facility or near-by?_____

-What traffic congestion exists near or around the facility?_____

-Is the facility fenced and secure?_____

31. Nature of domestic and international markets:

a) Describe what is known demographically about typical customers who will buy and used the products produced at the facility in terms of the following:

* Sex and distribution
* Age and distribution
* Marital status
* Education
* Occupations
* Geographic regions that products can economically compete with others
* Size of households
* What international markets can products be sold into?

* Where do these customers presently purchase these products?
* Is the retail market ready & able to accept frozen food products?
* Are similar products available &/or needed?
* Are new potential customers entering or expected to enter the markets?
* What prospects of foreign or domestic competitors to enter the markets?

b) Define and describe all the potential export markets the products could be sold into:

* How & what costs to get into these markets?
* Who are the major potential buyers, what volume-price-problems to get to?
* Who would be the competition in these markets?
* Define the specific niche markets the product would be protected against?
* Define the total market usage of all potential products this facility might be able to produce for; this will provide future expansion plans and timetables against the strategic business plans.
* Establish the total markets sales revenue potentials for planning purposes.

c) Define the present &/or expected customers that purchase in volume for Domestic & Export Markets.

* Number of supermarket chains, smaller chains, and others at retail
* Number of international and other large hotels
* Number and types of larger traditional restaurants
* Number and types of International, National large fast food operations
* Number of hospitals, universities, schools that might purchase products

d) Define the basic market segments:

* What are the various segments in each marketplace, region, country?
* What are the estimated sizes of each market (tons and revenue)?
* Which segments contain the most potential buyers and prioritize each?
* Can these segments physically store-display &/or use the products?
* Product quality--What is or will be demanded by each niche of sales?
* Product pricing--What can or will the market bear?
* Who is supplying these markets currently, and how will they react?
* What do the various customers want, expect, or demand?

e) Define the competitive situations:

* Are product similar currently being sold in each targeted region/country?
* What have the total sales been for past five years in each target market?
* Which organizations would facilities products compete with directly, and What is the market share and monetary sales volume of each?
* Define the competition by local, region and international basis.
* Are the competitors (present & future) national or international?
* Will all products be used at a constant rate, or will demand seasonal?
* How will the State, general region, and international economies effect the sales from this facility?

f) Define the pricing and sales/marketing programs:

* What will be the overall pricing strategy be for this organization?
* How will they price against competition?
* How will competition react to pricing strategies?
* What terms of sale shall be offered to customers?
* Will products be priced EX FACTORY, OR DELIVERED?

* Define the duty costs to export to various countries.
* Define the Point of Sale Materials.
* Define the sales and promotions to be offered.
* Define media and advertising strategies and budgets.
* Define the sales staff budgets, personnel and needs.

g) Define the distribution systems:
* What distribution channels are currently being used?
* What problems have been identified with current channels of distribution?
* Do these businesses have the capacities to effectively carry and distribute the products?
* What are the costs associated with using existing channels of distribution?
* Does a new system need to be established?

h) Define the transportation, storage and distribution:
* Where does facility lay in relation to domestic markets and major population centers?
* What is distance to closest sea port?
* Is the port equipped to handle refrigerated 40 ft. sea containers?
* What are the charges to ship to port, at port and to load on sea vessel?
* Define shipping costs (40 foot refrigerated sea container) to:
  -Malmo and Stockholm Sweden; Helsinki Finland; Copenhagen Denmark; Gadansk Poland; Hamburg Germany.
  Define International Refrigerated Truck shipments (20 to 25 tons per load) to: St Petersburg, Moscow Russia; Warsaw Poland; Prague Cz; and Berlin Germany.
* Define the problems and financial costs to establish freezers for retail shops and restaurants in the domestic markets.
* Define the problems and financial costs to establish frozen transport trucks.
* Define the problems and financial costs to establish sufficient frozen storage to handle estimated tonnages for the short and intermediate term production from the facility.
* Define who will be the distributor of goods from the factory to the customers.

32. Describe the overall water systems that services the proposed facility:
* Is the water potable?
* Who supplies the water?
* Is it river water, underground well water?
* Define the quantity and dimensions and pressure of water supplied?
* Define the degree of water hardness?
* Is the water treated with chlorine or other chemicals?

33. Describe the overall situation of the boiler that is in the proposed facility:
* How old and in what mechanical shape?
* What is the rated capacity of boiler and under what pressures?
* What source of fuel is required to fire the boiler?
* How much excess capacity might be available for the proposed fry line?
* What are the expected fuel costs to operate the boiler?
* How many persons are required to make steam and what labor costs per

hour?

* Describe the controls and instrumentation of boiler system, including condensate return to boiler.
* Describe the feed water and chemical condition used.
* Describe the piping and insulation of steam lines.
* Describe the wiring, controls, interlocks & safety devises used.

34. Describe the costs, availabilities, purity, and governmental regulations for the following:
    * Dextrose
    * Sodium bi-sulfite
    * Sodium Acid Pyrophosphate ($Na_2H_2P_2O_7$)
    * Chlorine gas or other forms as sodium Hypo-chlorite.
    * Ammonia for compression equipment.
    * Printed cardboard cases for french fry shipments.
    * Printed poly bags either preformed or continuous roll stock.
    * Tape, or glue, for closing cases.
    * Boiler treatment compounds.
    * Cleaning agents, sanitizer's.
    * Wooden pallets.
    * Stretch wrap plastic.
    * Laboratory chemicals, solvents, reagents.
    * Sprout inhibitor for storage of long term potatoes.

35. Describe the past, present, and how to cope with the unknown future in respects to inflation and dealing in both the domestic and international export markets for purchases and sales involving this proposed facility.

35. Describe the political stability to develop and operate the proposed facility in Estonia.

36. Describe the social needs and stability to develop and operate the facility.

37. Describe the Governmental concerns to establish this facility.

38. Describe the economy of the area:
    1. Projected inflation
    2. Projected economy
    3. Tax benefits
    4. Currency stability and how to deal with international monetary problems.
    5. Problems of Entry into the markets
    6. Taxes, or other financial barriers

39. Describe the labor analyses of the area:
    1. Availability of unskilled, semi-skilled, skilled and professional workers.
    2. The degree of unionization
    3. Wages or salaries (regular hours and overtime hours)
    4. Work week, holidays and day length
    5. Work restrictions for female and male employees
    6. Paid holidays
    7. Paid vacations
    8. Paid sick leave or medical assistance

9. Workman's compensation for:
    a) sickness
    b) termination
    c) layoffs
    d) other
10. Union contracts
11. Union disputes and arbitration
12. Union seniority systems
13. Labor/management relationships
14. Employment in the immediate labor markets (%) employed and unemployed:
    a) agriculture
    b) construction
    c) manufacturing
    d) timber or lumber operations
    e) transportation
    f) service industry
    g) finance or banking
    h) government
    i) other
15. The percent males in the work-force, the percent female in the work-force.
16. Any restrictions for females in the work-force
17. Seasonality of any of the above (#14) trades or work sectors
18. Describe the manufacturing sectors:
    a) How many of each type manufacturing plants are located in the area?
    b) Rank the six largest manufacturing facilities or industries.
19. Describe any of the following industry sectors in the area:
    a) machine or metal fabrication plants
    b) chemical plants
    c) plastic or plastic film manufacturing
    c) paper or cardboard box manufacturing
    d) frozen food warehouses or storages
    e) animal feed lots or similar operations
    f) other starch or alcohol manufacturing facilities
    g) rail services
    h) trucking services
    i) international sea shipping lines or services
    j) airlines, domestic or international

20. Are any of the above (#19) owned by government or regulated by law?
21. Describe in detail any frozen or cold storage facilities in the area:
    a) where are they located
    b) who owns these facilities
    c) how large are they
    d) what excess capacities do they have
    e) what are the physical conditions of these facilities
    f) are there provisions against theft and damage due to thawing?
    g) how do they stack within the facilities?
    h) what mechanical means to move and load goods into/out of facilities?

22. Describe the water (wells, dams, rivers etc.):
    a) can they supply adequate quantity and quality?
    b) who owns or regulates these services?
    c) what are the rates and are they regulated?
    d) name of supplier
    e) can a chemical and bacterial analyses be obtained?

23. Describe the electrical supply:
    a) what is the source (hydro, steam, nuclear)?
    b) who is the supplier?
    c) what are the rates and are they contracted?
    d) who regulates?
    e) availability, seasonality, peak demands, curtailment and overall reliability?

24. Describe the sewage treatment:
    a) what are the governmental regulations in detail?
    b) where are the services located?
    c) can these facilities handle additional hydraulic and organic loadings?
    d) at what costs to have waste water treated?
    e) define the pollution laws.

25. Describe the gas or fuel to be used in this facility:
    a) type supplied, BTU and analysis
    b) who are the supplies of each possible?
    c) what are the availabilities of each source?
    d) at what cost per some unit of measure?
    e) who are competing for these materials?
    f) what are the long term best forms to use?
    g) how the fuel is physically broughT to the facility

26. Describe the heating, ventilation & air condition anticipated

27. Describe the Governmental concerns:
    a) water intake into the facility
    b) water discharge from the facility
    c) chemical usage within the facility
    d) pollution via- air, dust, noise, water
    e) Food & Drug as well as sanitation aspects
    f) worker safety environment
    g) safety boards concerning health & accidents
    h) insurance
    i) taxes
    j) licenses (varied)
    k) zoning and permits
    l) building permits and commissions

28. Describe City, county, state/providence influences:
    a) building codes
    b) utility codes
    c) water codes

d) power codes
e) fuel codes
f) sewage codes
g) sanitation codes
h) health codes
i) boiler codes
j) municipal codes for: fire codes; police codes
k) smoke and dust regulation
l) labor law codes
m) building permits
n) zoning regulation
o) earthquake regulations
p) snow, rain, wind or other weather related regulations

40. Please furnish the names of three or more heavy steel fabrication contractors, their background, their facilities, their equipment, their capabilities, and what their pricing structure may be to allow us a better understanding of what is available in-country.

41. Please furnish the names of three or more heavy building construction contractors, their facilities, their mode of operations, their capabilities, and what it costs US$ per square meter for food processing type of construction (walls, roof, floor, wiring, plumbing etc).

42. Please furnish more detail on the agricultural aspects, emphasis on potatoes:
a) 25, 50, and 100 km radius in the region
b) crop rotation practices and crops grown
c) the yields of each crop per ha
d) the size distribution--length, flat side diameter, round diameter
e) the solids distribution as per salt brine separation
f) the reducing sugar percentage, done by raw fry tests
g) the cooked textures and problems with after cooking darkening
h) the cultural farm practices used (hand labor, mechanical?), the overall farm growing practices for all of the main type of crops within the region

43. Please furnish more detail on the procurement of potatoes:
a) do they offer pre-season contracts
b) are all potatoes being considered to be grown by members of the group
c) who are the other potential potato farmers
d) describe the average or typical potato farm and its other crops
e) can potatoes be bought from the local markets, iF so what months
f) when are the potatoes to be paid for
g) who finances the farmers for seed, chemicals, etc.
h) are there specific grades for potato quality

44. Please furnish more detail on potato storages:
a) primitive (clamps or etc), Semi-modern, modern with forced air ventilation & humidity
b) are potatoes stored in bins or bulk
c) what is the bulk density of each potato variety (kg per cubic meter)
d) what are the costs per square meter of modern potato storages
e) what practices are used to prepare the warehouses to receive the new crop

f) what practices are used to fill warehouse, and to what degree mechanized
g) what practices are used to cool down the new filled warehouses
h) how rough have the potatoes been handled prior to and during the filling of warehouse
i) are any of the warehouses equipped with humidifying devices
j) describe the air ventilation systems and hours operated
k) describe the know quality and losses coming out of extended storage

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