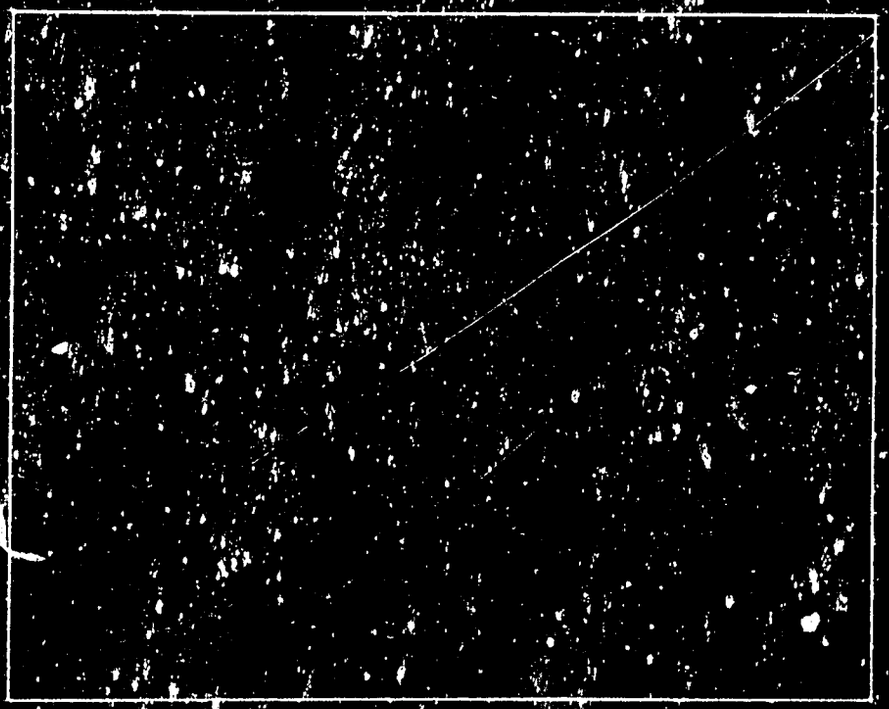
PAKISTAN EDIBLE OILS STOCK AND TRADE MANAGEMENT

HOW TO IMPROVE MARKET STABILITY LOWER IMPORT COSTS AND SAVE FOREIGN EXCHANGE IN THE EDIBLE OILS TRADE

PRODUCTION AND FOREIGN EXCHANGE GAINS FROM PROPOSED POLICIES



HOW TO IMPROVE MARKET STABILITY, LOWER IMPORT COSTS AND SAVE FOREIGN EXCHANGE IN THE EDIBLE OILS TRADE

Prepared for the

Government of Pakistan

by

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PREFACE

In 1984, the Pakistan Mission of the U.S. Agency for International Development published a comprehensive analysis of Pakistan's edible oils production potential, entitled *Pakistan's Edible Oilseeds Industry*. The report concluded that, although Pakistan has sufficient agricultural resources to significantly increase edible oils without reducing other major crop production, no major progress on production and import dependence is likely until a comprehensive set of economic policy changes are implemented. The Oilseed Report and a concurrent review of edible oil sector self-help measures under the U.S. PL-480 Program demonstrated the need for a new, long range edible oils strategy.

This report was prepared in response to the Governments of Pakistan and the United States agreeing to conduct a comprehensive analysis of Pakistan's edible oils stock and trade management system, which would complement the Oilseed Report and specify the foundations of a new edible oils strategy. The report analyzes revised edible oils market data under past and current policy conditions and forecasts a future import dependency problem that is more pessimistic than earlier expert opinions. The policy analysis concludes that significant reductions in future edible oil import costs are possible only if the Government of Pakistan implements a comprehensive package of policy reforms.

The report analyzes current pricing policies and demonstrates the advisability of decontrolling all domestic oil and oilseed prices. A major new proposal is made for using an import oil price floor to stabilize the domestic market and exploit Pakistan's agricultural comparative advantage in the long term international markets. The report presents compelling evidence on the detrimental effects of current edible oil industry regulations and public sector production. A strong recommendation is made for the development of an edible oils commodity exchange to improve trading efficiency and create incentives to reduce marketing costs. Finally, the report cautions that the recommended new strategy requires the implementation of several simultaneous, interdependent policy reforms. The edible oils sector is expected to become increasingly stagnant unless prices are decontroiled in concert with a comprehensive program of deregulation, public sector disinvestment, and improved trade infrastructure.

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ABBREVIATIONS

APP	Associated Press of Pakistan
CBT	Chicago Board of Trade
CCC	Commodity Credit Corporation
CIF	Cargo, Insurance and Freight
EEC	European Economic Community
EODC	Edible Oilseed Development Corporation
GCP	Ghee Corporation of Pakistan
GOP	Government of Pakistan
KLCE	Kuala Lumpur Commodity Exchange
LTA	Long Term Agreement
MOI	Ministry of Industries
MT	Metric Ton
NGFI	Non-Grain Feed Ingredients
NWFP	Northwest Frontier Province
PL-480	U.S. Public Law-480
RDB	Refined, Deodorized and Bleached (palm oil)
Rs	Pakistan Rupee
STM	Stock and Trade Management
TCP	Trading Corporation of Pakistan
USAID	U.S. Agency for International Development
USDA	U.S. Department of Agriculture
USSR	Union of the Soviet Socialist Republic

CONVERSION FACTORS

1 Hectare	= 2.47 acres
1 Kilogram	= 2.205 pounds
1 Metric Ton	= 2205 kilograms
1 Maund	= 37.327 kilograms = 82.306 pounds
1 Bushel (soybean)	= 60 pounds
1 US$	= 14.2 Pakistan Rupees

EXECUTIVE SUMMARY

EDIBLE OILS: A MAJOR OPPORTUNITY TO STABILIZE THE MARKET, LOWER IMPORT COSTS AND SAVE FOREIGN EXCHANGE

Unless needed and appropriate measures are undertaken, annual imports of edible vegetable oil could increase to 2.6 million tons within a decade at an estimated cost of almost three thousand million dollars. However, whether or not remedial measures are implemented to increase domestic production and reduce imports, there are substantial savings and efficiencies which could be achieved through modifications of the edible oils stock and trade management system. Major improvements in the wholesale oil market would reduce marketing costs and rationalize price linkages between domestic oilseed markets and imported oil markets.

Thus, the GOP should tackle the overall edible oils problem on two interrelated fronts: (1) Decrease imports by stimulating domestic production; and (2) Stabilize and lower the foreign exchange costs of imports by modernizing the country's edible oils stock and trade management system. These actions would constitute the core of a coherent and rationalized edible oils policy in Pakistan.

A March, 1984, USAID Study on Pakistan's Edible Oilseed Industry determined that under policies of total price decontrol and denationalization, the country's annual edible oil production could rise to 479.0 thousand tons in 3 to 7 years. Assuming that these policies had been implemented five years ago and based on estimated production and edible oil import prices for 1984, the additional domestic production would have saved about $159.0 million in foreign exchange in 1984 alone.

Since the March, 1984, study, few of the needed structural and institutional adjustments to deregulate prices and denationalize the industry have been made. Meanwhile, Pakistan's food security in edible oil has deteriorated even further. The present study, a detailed analysis of the nation's edible oil stock and trade management situation, shows that the need for bold government action to increase domestic production and processing through private sector mobilization is even more imperative then previously thought.

This latest study of Pakistan's edible oil crisis has identified additional measures to stabilize and/or reduce the foreign exchange cost of imported oil. If the policy recommendations contained herein are implemented in concert with those of the first report, Pakistan could realize an additional *annual* import savings of $633.0 million by 1994. In other words, by aggressively tackling the import problem and modernizing its stock and trade management system, the GOP could generate cumulative foreign exchange savings of about $2.6 billion during the next decade.

Need for a Modernized National Edible Oils Trading Strategy

The present edible oils trading strategy and policy produces unacceptable vulnerability to chronic sharp fluctuations in the world market. With current high edible oil import levels likely to rise, this situation promises to become intolerable, even unmanageable. A new strategy is required.

The new strategy would involve the following elements:

* Decontrol Retail Edible Oil Prices
* Denationalize the GCP
* Rationalize Imported Edible Oil Prices
* Restore Open Competition in Oilseed Markets

Such a strategy is consistent with the GOP's Sixth Plan goals and objectives of increased food security and its views

with respect to relying on the private sector to play a major role in achieving national investment, income, production and employment targets. The strategy requires no new technologies. It employs proven stock and trade management practices and is within the capacity of the GOP and Pakistani private sector.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Future Edible Oil Import Requirements

It is quite likely that Pakistan will be importing at least two million tons of edible vegetable oil annually by 1994, even if substantial price decontrol policies are followed throughout the next decade. If past experience is an accurate indication of future imports, the 1994 import level will be about 2.6 million tons. These projections indicate little hope of achieving sharp reductions in imports during the next decade. Imports for 1984 are forecasted to cost as much as $439 million under present edible oil policies and programs. Import costs could conceivably reach $1.1 billion by 1989 and $2.9 billion by 1994.

Future Edible Oil Storage, Handling, and Processing

Karachi port facilities are adequate and the private sector is capable of future expansion. Rail transportation and handling facilities are limited and show little possibility of improvement in the near future. Present refinery operating capacity will have to be doubled by 1989 and tripled by 1993. There appears to be sufficient private sector capital available for these future investments, but present pricing and other policies make major private investments unlikely.

Current Import Price Discovery Efficiency

The edible oils market is dominated by the GCP. The cottonseed oil market has no competition because the GCP has monopoly control of all cottonseed oil. There is little private sector competition for imported oil because the GCP is the major importer. During 1983-84, virtually all imported oil was purchased by the GCP. The GCP's import procurement methods are similar to most government procurement policies, but its monopoly or dominant position in the domestic market reduces price discovery efficiency and price competition.

PL-480 Program Performance

The amount of edible oil supplied under the PL-480 program does not diminish domestic edible oilseed production incentives because Pakistan's oil import requirements far exceed total domestic oil production plus PL-480 soybean oil purchases. The Ministry of Industries has stated that delays in finalizing annual PL-480 agreements cause each annual block of PL-480 deliveries to create excessive inventories since most of the deliveries coincide with the domestic cottonseed crush. Production and storage data supplied by the GCP do not indicate serious seasonal inventory problems associated with any soybean oil purchases, whether through PL-480 or open market purchases. On the contrary, Pakistan's dramatic increase in edible oil import demand over the past three years strongly suggests that the GOP can reduce its vulnerability to price hikes by PL-480 suppliers if it reduces the PL-480 negotiation period and lengthens its annual PL-480 delivery period.

Edible Oils Price Policy Linkages

The shortcomings of the present edible oils stock and trade management system are unavoidably tied to major pricing policy problems. Any attempt to improve edible oil trading efficiency will require simultaneous improvements in price and marketing policies. Trading efficiency cannot improve until pricing policies are modified to effectively protect the domestic oil market from abnormally low import prices and insure that domestic oilseed prices reflect long term imported oil prices. If the current practice of controlling the retail price of vegetable ghee is continued through 1994, Pakistan's cumulative edible oil import costs will be $2.6 billion more than if a price decontrol policy were adopted. If fundamental improvements are made to edible oils pricing policies, and the

GCP's monopoly status is abolished, there are opportunities for improving edible oils trading efficiency through the development of an edible oils commodity exchange.

Benefits of Futures Trading

The use of futures trading, coupled with cash trading, would save valuable foreign exchange. Futures trading enables edible oil buyers to minimize their cash commitments because they can buy and sell futures contracts at 10 percent of the total value. This margin advantage allows oil buyers to develop a buying program that hedges against the price peaks and valleys that occur throughout a twelve month period without making a large cash outlay at the time of each trade.

Pakistan's present edible oils importing system is guided by demand and shipping requirements, rather than a balanced program that minimizes the cost of future requirements. Even a modest set of futures trading positions taken during the summer of 1983 would have mitigated the foreign exchange burden caused by the sharp upturn in prices during the period December, 1983, to May, 1984. If implemented with the other policy recommendations of this report, a large part of the financial burden for imported edible oil, currently estimated at $40.0 million per month, can be transferred to the private sector.

Pakistan is one of the world's largest edible oil importers. Under its current stock and trade management policies, the nation's food security and overall trade position are held hostage to the fluctuations in the world's most volatile agricultural commodity market. The GOP would be well advised to follow the practices of other countries such as Turkey, Singapore and the USSR which routinely take futures trading positions in agricultural commodities to minimize foreign exchange costs and enhance their food security.

Buffer Stocks

Edible oil storage supply will not be adequate to handle the increasing demand; therefore the industry will not be able to purchase cash oil for buffer stock purposes. A promising alternative to future storage shortages would be to provide buffer stocks through hedging strategies in the cash and futures markets. The successful implementation of this program would require major restructuring of current pricing policies and assigning all production and marketing responsibilities to the private sector.

Recommendations

Storage, Handling, and Processing

The private sector should be encouraged to construct all new storage and refinery capacity while the GCP should be prevented from increasing its processing capacity. This posture is in keeping with GOP policy and the Sixth Five-Year Plan investment goals.

Basic Policy Requirements

In order to reduce edible oil import costs over the next decade, some difficult policy choices must be made quickly. The GOP should formulate and implement a long range national edible oils strategy. The development of a new edible oils commodity exchange would be a major step in improving industry performance and reducing long term import costs. However, the following specific policy changes are required before a commodity exchange program can be successful. The sooner these changes are adopted, the sooner Pakistan will benefit. (See Chapter VI for more details.)

* *GCP's monopoly control over the cottonseed oil market should be discontinued.*

* *The sanctioning procedure for private sector edible oil mills should be abolished.*

- *An import price floor program, tied to the long term rise in average imported oil prices, should be implemented and rigidly enforced.*

The GOP should also decontrol retail edible oil prices. Imported oil prices are falling and may soon drop below the current domestic procurement price and the proposed import oil floor price. Under these circumstances decontrolling oil prices will allow retail prices to move in concert with steady, upward changes in the import oil floor price.

An Edible Oils Commodity Exchange for Pakistan

The GOP should promote a cooperative effort between the GCP, private refineries and general traders to establish a new commodity exchange. The business community is familiar with the principles of an exchange. The new exchange could be modeled on the Cotton Exchange, which operated freely during 1947-1974, as well as the present Karachi Stock Exchange.

Commodity Consulting Ventures

A temporary and short term solution for reducing Pakistan's vulnerability to import price fluctuations is to hire commodity trading firms to provide trading advice or execute trading decisions. There is a wide choice of options that can define the scope and responsibility of the GOP and the consulting company. This arrangement would improve the buying programs of oil refineries with respect to price, shipping, and utilization of cash and futures positions. However, in the long run this function should be undertaken by private sector processing firms and traders.

The Trade Off

Concerns have been expressed that the recommended price deregulation component of a coherent, rationalized edible oil policy for Pakistan would generate political and social problems associated with higher prices and reduced consumption. Whether or not these concerns would be validated by actual experience is difficult to prove and, certainly, impossible to quantify. In any case, it is also important to consider what the consequences would be if the GOP failed to pursue the recommended program.

The projected level of edible oil imports would, over the next few years, represent an intolerable burden on foreign exchange. To meet such a bill would require import controls to reduce other basic imports. Thus, either edible oil or other imports would have to be curtailed, and rationing or other devices to restrict consumption would have to be imposed. It is evident that such a situation would lead to the same kind of political and social problems which some believe would occur if edible oil prices were decontrolled. In either case, the problems, in one degree or another, can be anticipated. But if the steps recommended are adopted, the offsetting benefits are substantial. If not adopted, the GOP is still left with the need to cope with these political and social problems with nothing at the end to show for it.

The foregoing assumes that there would be meaningful negative reactions to a rise in edible oil prices. However, it is clear that what will at most occur is a decline in the rate of growth, not an absolute decline in consumption. On the basis of consumer reactions to recent ghee price increases, it is furthermore doubtful that the negative political fallout would be serious. Thus, past experience combined with the analysis of future requirements makes the trade off decision clear The edible oil sector in Pakistan needs to be modernized and rationalized in order to enhance national food security, strengthen the country's foreign exchange position, achieve the Sixth Five-Year Plan investment targets and, in the process, pursue a course of action with less unfavorable or more favorable political and social consequences than would result from a continuation of present policies.

CHAPTER I

INTRODUCTION

The 1974 World Food Conference sparked new interest in "food security" for developing countries. Food security is generally defined as a strategy and/or condition that permits a country to avoid high risks of food shortages. A country's food security strategy would be a prudent combination of measures to encourage efficient utilization of domestic agricultural resources and measures to hedge against abnormally high imported food prices.

The GOP and USAID/Pakistan have identified food security as one of their major goals. Because Pakistan is vulnerable to sharp price fluctuations and is experiencing ever growing costs for imported edible oils, it is prudent to examine the applicability of stock and trade management approaches to increasing the nation's food security.

Objectives of the STM Study

In 1982, the GOP and USAID/Pakistan agreed to a Public Law 480 Self-Help Measure that called for a study of the feasibility of alternative edible oil stock and trade management (STM) operations. The scope of work for the study requested a comprehensive assessment of Pakistan's current edible oils import, storage and handling practices and recommendations for alternative stock and trade management practices that will reduce the foreign exchange costs of imported oil and improve the efficiency of edible oils trading and marketing. Five specific study tasks were identified:

1. An assessment of Pakistan's edible oil production and consumption trends under current and alternative government policies.

2. An assessment of future world edible oil market trends and their implications for future imported oil prices.

3. An assessment of Pakistan's current edible oil extraction, processing, transporting, and storage capabilities and future requirements under scenarios developed in Task 1.

4. An assessment of the range of edible oil import trading options available to Pakistan and their relative advantages and disadvantages.

5. Recommendations for an improved edible oils stock and trade management strategy, including policy requirements for its successful implementation.

Background

Pakistan currently imports about four-fifths of its edible oil requirements. A decade ago edible oil consumption was about two-fifths of the present level, but imports were only one-half of total consumption. During the past decade these trends have meant that domestic edible oil production has remained almost unchanged, while consumption almost doubled. The increasing dependence on imported edible oil has created one of Pakistan's most serious balance of payments problems.

The foreign exchange costs of edible oil have risen with increased imports and have also become increasingly volatile as a result of new sources of instability in the world oil market. Pakistan's approach to this situation has not effectively coped with either rising or rapidly fluctuating prices.

There is a long history of international donor interest in assisting Pakistan with its edible oil problem. Most of the donor assistance has consisted of periodic technical consultancies that have largely concentrated on technology-transfer programs to increase oilseed production. Until recently, expatriate assistance has failed to exploit fully the opportunities for successfully dealing with the broad scope of the edible oil problem.

The USDA Oilseed Study

In 1982, USAID/Pakistan requested USDA's Office of International Cooperation and Development to conduct a comprehensive study of the Pakistan edible oilseed industry. The study involved an integrated analysis of oilseed research, extension, processing, feed, marketing, and policy problems. The final report, *Pakistan's Edible Oilseeds Industry*, was published in March, 1984.

The USDA study is one of the most comprehensive commodity studies ever conducted in a developing country. It contains the technical analyses of the oilseed production, research, and processing problems found in earlier Pakistan oilseed studies, but it also viewed these problems through an industry-wide perspective that considers the linkages between domestic oilseed production and processing markets, livestock feed markets, oil imports, and the retail edible oil market.

The study leaves no doubt that Pakistan can substantially reduce its imported oil dependence if it allows domestic oilseed/edible oil prices to float upward in concert with long term international trends and establishes a new policy which encourages strong private sector competition in the domestic production and processing of edible oils.

The USAID Oilseed Policy Briefing

In November, 1983, USAID/Pakistan gave an executive oilseed policy briefing to the Minister of Food, Agriculture, and Cooperatives and about 20 other senior GOP officials in the agriculture, finance, and commerce ministries. The briefing incorporated the USDA oilseed study's "Summary of Conclusions and Recommendations" and employed a computer graphics presentation. The briefing emphasized the point, among others, that ongoing oilseed research and development programs would not be effective until the government adopts substantial market reforms.

Recent Edible Oils Marketing Developments

At the time of the USAID briefing, the GOP was deeply concerned over recent sharp increases in imported oil prices. Between March and November, 1983, imported oil prices almost doubled to between $750 and $850 per metric ton (palm and soybean oil). The foreign exchange costs became so great that imports were curtailed and newspapers began reporting retail oil shortages throughout the country. Based on the USDA study, the GOP appeared to be subsidizing about one-third of the retail price of vegetable ghee (the predominant household edible oil). The USAID briefing emphasized the oilseed study's major recommendation that retail vegetable ghee prices should be allowed to rise at least 40 percent.

About one week after the briefing, the government raised the retail price of vegetable ghee by 26 percent, from Rs 10.7 to Rs 13.5 per kilogram. (This is not to suggest that the Study's recommendations directly led to the price increase. Clearly, however, the findings, conclusions and recommendations of the study validated the GOP's decision to raise prices.) According to a model developed for the oilseed study, a 26 percent increase in the retail price of vegetable ghee would lead to: a 10 percent decrease in vegetable ghee consumption; a 39 percent increase in liquid cooking oil consumption; and a four percent decrease in total edible oil consumption. There are no available empirical estimates of price-related consumption effects to test the actual effects against the projections of the model. However, public protest was apparently quite limited, and there is some evidence that consumption did not decline to the extent predicted by the model.

In early June, 1984, the GOP continued to fix the retail price of vegetable ghee at Rs 13.5 per kilogram, but newspapers reported some rural retail shortages that could be excessive even during Ramazan. Palm oil contracts were signed for July delivery at $842 (Rs 11,578) per MT. At U.S. cash prices of about 40 cents per pound, soybean oil could have had a C.I.F. Karachi price of as much as $ 930 (Rs 12,788) per MT. The USDA oilseed study estimated that if imported vegetable oil (soybean oil) cost Rs 12,350 per MT, a retail vegetable ghee price of approximately Rs 18 per kilogram would have been required to pay all production and marketing costs.

The major effects of the recent price increase have reduced government subsidy costs (and perhaps a slight decrease in consumption), but no new price incentives seem to be forthcoming to stimulate increased domestic production and processing efficiency. GOP support prices for non-traditional oilseeds have been increased slightly over the last four years (Table 1-1). While support prices for 1984 do exceed estimated minimum break-even prices, non-traditional oilseed production has not increased.

TABLE 1-1. SUPPORT PRICES FOR NON-TRADITIONAL OILSEEDS

(Rs per 40 kgs.)

	1981	1982	1983	1984
Sunflower	132	140	140	150
Safflower	112	120	120	125
Soybean	117	122	122	140

Source: Agricultural Prices Commission

There is no cottonseed support price and the lint support price does not include the full derived market demand for cottonseed. The cotton market is further distorted by the fact that there is only one official buyer of cottonseed oil (the GCP). The fixed government procurement price for cottonseed oil was set at Rs 200 per maund from 1974 to 1980, when it was raised to Rs 250 per maund. At the time of the retail ghee price increase in November, 1983, the procurement price was raised to Rs 320 per maund. The GCP also buys non-traditional oils for the same procurement price. During the USDA oilseed study, the GOP made a major change in oil importing procedures. Previously, the nationalized oil refinery, the Ghee Corporation of Pakistan (GCP), purchased all of its foreign oil through a government trading agency, the Trading Corporation of Pakistan (TCP) at the domestic procurement price of Rs 250 per maund.

During 1981 and 1982, imported oil prices often fell below the domestic procurement price, which induced private refiners to import directly, rather than pay the higher procurement price. By mid-1983, imported oil prices rose above the procurement price, so private refiners began purchasing imported oil from the government at the relatively lower procurement price. On July 1, 1983, the GCP began importing oil directly and selling to its refineries and private refiners at the procurement price. Private oil refiners are still permitted to import oil after obtaining an import license/foreign exchange permit from the Ministry of Finance. The cost of the rising subsidy prompted the government to raise the procurement price to Rs 320 per maund, the same proportionate increase as in the retail ghee price. From November, 1983, through September, 1984, landed imported oil costs remained above the new procurement price, which caused virtually all imported oil to be purchased by the GCP for all refineries.

Imported oil prices are currently near the procurement price. If import prices minus landing costs and up-country transportation costs fall significantly below the procurement price, private refiners will again find it advantageous to import directly rather than pay a higher price to the GCP. It is not clear how the GOP will respond to relatively lower import prices. In the past, the TCP imported all GCP requirements and collected the price difference as an import tariff. The GCP has not been designated the exclusive edible oil importer. Lacking the power to be a monopoly seller of imported oil, the GCP faces the prospect of charging its refineries Rs 320 per maund while private refineries buy at a much lower price, but sell at approximately the same retail price. As in 1981-82, future large private oil importation at costs below the domestic procurement price would weaken the internal wholesale oil price and remove all incentives to increase domestic oil production.

The GOP has also made an important change in the vegetable ghee tax. The government has consistently viewed vegetable ghee to be a health risk because of the high concentration of saturated fats that result from hydrogenation of vegetable oils. To support a public policy goal of decreasing the attractiveness of vegetable ghee (which comprises over 80 percent of edible oil consumption), a Rs 1.3 tax is levied on each kilogram of vegetable ghee.

Palm oil, which resembles vegetable ghee, has been imported as vegetable oil, then retailed as vegetable ghee after minimal processing without the vegetable ghee tax assessment. Since palm oil does not require hydrogenation and is often sold at the same price as vegetable ghee, its importation has been quite lucrative. Last year, the GOP moved to reduce the relative profitability of palm oil by assessing a "vegetable ghee" tax when it is landed.

In late 1983, the GOP announced that beginning July 1, 1984, responsibility for GOP oilseed development would be transferred from the GCP to a newly created Edible Oilseed Development Corporation (EODC) in the Ministry of Agriculture. The EODC would operate primarily as a commodity-specific extension service. Reorganization of the oilseed development program may be desirable, but to be effective, major policy reforms will be necessary. In May, 1984, the GOP postponed implementation of the EODC for one year. Recently, however, new plans were announced for the EODC to be implemented on January 1, 1985.

Organization of the Study

Chapter II reconciles various estimates of past edible oils supply and utilization statistics and forecasts alternative trends through 1994. Chapter III assesses world edible oil market trends and their implications for future import prices. Chapter IV describes Pakistan's current capability to store, process, and transport edible oils and assesses the implications of consumption and import forecasts on future edible oils processing and handling requirements. Chapter V describes current import trading procedures and assesses alternative trading procedures. Chapter VI evaluates some options for a comprehensive policy strategy for improved edible oils stock and trade management.

CHAPTER II

PAKISTAN'S EDIBLE OILS SUPPLY AND UTILIZATION

Since 1971, annual edible oil production has not varied by more than 78,000 tons, while annual oil requirements for cooking oil and vegetable ghee through 1983 have increased by 603,000 tons. This production shortfall, plus additional industrial and carryover requirements, resulted in imports steadily increasing from 46,000 tons in 1971 to 721,000 tons in 1983. Past edible oil trends reflect the government's decision to incur successively greater foreign exchange costs rather than decontrol domestic oil sector prices and promote financial incentives to reduce imports. Past trends also permit some informed speculations about future production and import trends.

Past Experience

Edible oils supply and utilization statistics for the 1971-1983 period are presented in detail in Annex A. Past production, demand, and import trends are summarized in Table 2-1.

Production

Pakistan's traditional oilseed crops are cotton, mustard and rape, with about two-thirds of total edible vegetable oil production coming from cottonseed. The cotton sector has slowly stagnated over the past decade. Annual acreage has remained steady at about two million hectares; however, extracted oil yields per hectare have declined slightly. Government control of the lint export market and the Ghee Corporation's exclusive control of cottonseed oil buying have had the effect of weakening cotton's competitive position.

Most of the remaining edible oil production comes from mustard and rapeseed. Mustard and rapeseed oils are not subject to price controls; however, supply has remained relatively constant.

Both cottonseed oil and mustard-rapeseed oil supplies do not show positive responses to oil prices (Annex B). The estimated annual negative production growth rate of −1.1 percent, together with rising demand projections, portends an unmanageable financial and foreign exchange situation with broad implications for food security. Edible oil policy reform is clearly needed.

The production estimates in Table 2-1 explicitly exclude estimates of non-traditional oilseed production. Analysis of the available time series data shows a high yield and acreage variability which prevents the establishment of a statistical basis for including non-traditional oilseed production in the national crop estimates. This, combined with the lack of sustained growth in cropped area for oilseeds, leads to the conclusion that the Ghee Corporation's estimates of actual production are overly optimistic.

Demand

Edible vegetable oil demand, represented by cooking oil consumption and crude oil processing requirements for vegetable ghee, has increased 10.4 percent per annum (Table 2-1), due largely to retail price controls and increased disposable income. In general, edible oil demand is income elastic in developing countries and Pakistan is no exception. It can also be concluded that demand is responsive to real declines in the relative price of edible oil.

TABLE 2-1. PAKISTAN'S EDIBLE OIL MARKET, 1971-1983

Year	(1000 Tons) Production (a)	Demand (b)	Imports (c)
1971	234	250	46
1972	238	284	65
1973	221	333	175
1974	209	356	197
1975	174	373	268
1976	162	438	285
1977	198	473	310
1978	160	531	392
1979	213	580	416
1980	211	617	467
1981	216	770	624
1982	229	848	657
1983	162	863	721
Annual Growth Rate(%) (d)	−1.1	10.4	20.3

Notes:

(a) Production includes only cottonseed oil and mustard-rapeseed oils.

(b) Demand includes only oil requirements for cooking oil and vegetable ghee.

(c) Imports reflect cooking oil and vegetable ghee requirements, plus industrial requirements, plus carryover adjustments, minus production.

(d) Growth rates are estimated by the semi-log regression method: $Ln(X) = a+r^*T$, where X is the annual quantity of oil, T is an arithmetic trend index beginning with 1=1971, and r is the estimated compound annual growth rate.

Source: Annex A.

Mustard and rapeseed oils are usually retailed as crude oils, with no additional refinement after extraction by village kohlus. These oils meet most of the cooking oil demand. Retail crude mustard oil prices, although not subject to price controls, appear to vary near the range of vegetable ghee prices (Annex B, Table B-1). Most of these oils are consumed in rural areas where, after a short lag, preferences are following urban trends and switching to vegetable ghee.

The market share of other liquid vegetable cooking oils appears to be declining because retail vegetable ghee prices have remained artifically low. The GCP retails sunflower oil at a premium over ghee. There is no evidence that liquid cooking oil demand will grow relative to vegetable ghee until ghee sells for a premium of at least Rs 3 per kilogram over cooking oil prices.

Industrial edible oil demand is excluded from Table 2-1 because it has generally varied between only 30 to 50 thousand tons annually.

Imports

It should not automatically be concluded that the sharp rise in edible oil imports since 1971 (20.3 percent annually) will continue indefinitely. A trend that begins from a relatively low base, e.g., imports in 1971 and 1972, will, if extrapolated incautiously, produce overestimates of the actual results. However, the last three years strongly suggest a behavioral change that may be irreversible over the next three to five years.

Retail price controls, abnormally low import prices in 1981 and 1982 (Annex E, Table E-6), and the government's willingness to allow private edible oil refineries to import directly, rather than through the Trading Corporation of Pakistan, are major causes of those sharp increases in imports. Prior to 1981, the annual mix of soybean and palm oil imports was about even; however, palm oil imports almost doubled during the next two years (Annex A, Table A-3). There is little doubt that most of the additional palm oil (between 140 and 180 thousand tons) was sold as vegetable ghee, near the retail ghee price, and without a ghee tax levy.

Palm oil imports dropped sharply in 1983 as palm oil prices rose to record highs above soybean oil, and private refiners appealed to the GCP for [imported] oil sanctions at the domestic procurement price. That 1983 edible oil imports still exceeded the previous year's total as record prices were paid suggests that a major, irreversible demand threshold was crossed.

Alternative Projections for the Next Decade

Edible oil production and demand data for the 1971-1983 period were used to estimate a series of forecast models (Annex B). Production and demand were projected to 1994 from the base year 1983 with two policy scenarios.

A *steady* state scenario was employed to project past policy performance into the future. Under the steady state assumption, past trends of exogenous forecast variables such as retail edible oil prices, per capita income, and crop oil yields are assumed to continue to change at the same rate in the future as in the observed past.

A *price decontrol* scenario was designed to estimate future edible oil production and demand behavior under policies that significantly deregulate and privatize the edible oils sector. In the steady state scenario, the past retail vegetable ghee price growth rate of 6.6 percent per annum was projected to 1994 and multiplied by an estimated price change parameter to produce an annual ghee price effect on demand. In the price decontrol scenario, all exogenous demand shifters were forecast at the same rate as during 1971-83, except the retail vegetable ghee price, which was assumed to increase at an annual rate of 10 percent.

In the steady state scenario, production of both cottonseed oil and mustard-rapeseed oils declined slowly. In the price decontrol scenario, however, the cottonseed yield was assumed to increase at an annual rate of almost four percent, rather than decline about one percent per annum as in the recent past. The additional yield is projected to be produced mainly by non-traditional oilseeds, particularly sunflower. By 1994, about 110,000 additional tons of oil (out of a total production of 308 million tons) are projected to be produced from about one-half million additional hectares of oilseed cropland. Alternative production projections to 1994 are summarized in Table 2-2.

Demand Projections

Under the steady state scenario, edible oil demand increases at an annual rate of about 11 percent, reaching about 2.8 million tons in 1994 (Table 2-2). This projection covers cooking oil and ghee manufacturing requirements, but ignores industrial demand and the demand for increased carryover stocks. The price decontrol scenario predicts an annual growth rate of about nine percent, or about 2.3 million tons in 1994.

Import Projections

Imports were not projected independently. Instead, the difference between demand and production

projections was assumed to be the shortfall that will be covered by imports. Under steady state assumptions, imports are estimated to grow about 13 percent per annum to about 2.6 million tons in 1994 (Table 2-2). This rate is substantially below the past rate of 20.3 percent, but significantly higher than other recent estimates.

TABLE 2-2. PAKISTAN'S EDIBLE OIL PRODUCTION, DEMAND AND IMPORTS: PAST AND FUTURE

	(1000 TONS)								
	PRODUCTION PROJECTIONS (a)			DEMAND PROJECTIONS (b)			IMPORTS PROJECTIONS (c)		
Year	Actual	SS	PD	Actual	SS	PD	Actual	SS	PD
1971	234			250			46		
1972	238			284			65		
1973	221			333			175		
1974	209			356			197		
1975	174			373			268		
1976	162			438			285		
1977	198			473			310		
1978	160			531			392		
1979	213			580			416		
1980	211			617			467		
1981	216			770			624		
1982	229			848			657		
1983	162			863			721		
Annual Growth Rate (%) (d)	– 1.1			10.4			20.3		
1984		205	214		965	950		760	736
1985		203	221		1067	1035		864	814
1986		200	228		1182	1128		982	900
1987		199	237		1310	1230		1111	993
1988		196	246		1454	1343		1258	1097
1989		194	254		1615	1466		1421	1212
1990		192	264		1794	1602		1602	1338
1991		189	274		1995	1751		1806	1477
1992		187	284		2220	1916		2033	1632
1993		184	295		2472	2096		2288	1801
1994		183	308		2753	2294		2570	1986
Annual Growth Rate (%) (e)		–1.1	3.7		11.1	9.2		13.0	10.4

Notes: (a) Projected scenarios are: Steady State (SS) and Price Decontrol (PD). Production PD forecast assumes additional oil is produced primarily by non-traditional oilseeds.

(b) Demand projections include only oil requirements for cooking oil and vegetable ghee.
(c) Import projections are demand estimates minus production estimates.
(d) Actual growth rates are estimated by the semi-log regression method described in Table 2-1.
(e) Projections are estimated by exponential growth models. Growth rates are therefore estimated at the compound growth rate required for the 1984 value to reach the 1994 value, 10 years later.

Finally, the price decontrol scenario predicts imports that would increase about 10 percent per annum over the 1984-1994 period, to a high of about two million tons in 1994. The price decontrol scenario growth rate is similar to other recent "steady state" forecasts. The main reason for the present steady state growth rate of 13 percent is the abnormally sharp increase in demand during the last three years.

Summary

The most predictable feature of projections is that they will be wrong. It should be emphasized, however, that past edible oil forecasts for Pakistan have consistently underestimated present consumption and imports. There are, furthermore, strong reasons why the steady state projections of consumption for this study are conservative. Pakistan's per capital income growth over the past decade has been well over 10 percent per annum in nominal terms and there is no reason to believe that it will decline in the future. During the same time period, excessive GOP price control has reduced the relative real price of vegetable ghee and consequently induced strong habit formation. As a result, liquid cooking oil demand has weakened, while consumers have become accustomed to sharply higher ghee consumption levels. Finally, Pakistan's per capita consumption of edible vegetable oils is still low (less than 10 kilograms per annum) relative to the standards of developed countries (approximately 30 kilograms per annum).

The empirical econometric evidence is weak, but the usual pattern for developing countries experiencing recent rapid income growth is a sharp increase in edible oil consumption, with income elasticities well over one. Pakistan appears to fit this pattern rather well. In short, there is little reason to doubt that this trend in edible oil demand will continue, with its alarming implications for national food security, during the next decade.

CHAPTER III

WORLD EDIBLE OIL MARKET TRENDS

The price Pakistan pays for imported edible oil is determined by a complex set of interactions between oilseed producers and meal and oil consumers around the world. Unpredictable weather changes make world oil supply forecasting very difficult. During the last decade, changing agricultural and trade policies in the exporting countries have caused additional prediction problems. Population growth, rising incomes and the high importance of oils and fats in low income families' diets have tended to increase overall edible oil demand.

Production

Pakistan's two major imported edible oils, soybean and palm, also have dominant roles in the world edible oil market. During the last decade, annual world production of the so-called "soft" edible oils and palm oil averaged about 35 million tons. Soybean oil has accounted for about 40 percent of total production, compared to palm oil's approximately 15 percent share. About one-third of total production has been exported. Soybean oil is about one-half of all exported oil while palm oil has the next largest export share, at about 20 percent.

World vegetable oil prices are expected to be relatively stronger than protein meal prices since beginning inventories of most oils and fats are down sharply from year-earlier levels. In addition, slow growth in livestock production is reducing availability of competing animal fats.

U.S. Market

The U.S. continues to dominate the world soybean oil market, although Argentina and Brazil weakened its position during the past decade. In recent years, the U.S. has produced about five million tons of soybean oil annually, or about 40 percent of the world supply. About 25 percent of world soybean oil exports are supplied by the U.S.

U.S. soybean crops suffered major droughts in 1947, 1953, 1955, 1965, 1974, 1976, 1980, and 1983. In each successive year after a drought soybean acreage increased. The 1984 soybean crop remains to be harvested, but yields in years following earlier droughts were higher, except for the 1948 and 1981 seasons.

On September 12, 1984, the USDA released its latest estimates for grain and oilseed crops. Soybean production is estimated at 2,027,600 bushels from harvested acreage of 66.8 million acres and a yield of 30.3 bushels per acre. Corn production is 7,552,000 bushels from harvested acreage of 71.1 million acres and a yield of 106.3 bushels per acre. The soybean acreage is up about eight percent from 1983 which should allow for a moderate increase in 1984-85 carryover stocks, but the carryover will still be low compared to use. Soybean prices are estimated at $5.50 to $6.00 at harvest. Major downward pressure on soybean prices may be exerted by expected higher world edible oil supplies and recent strong corn exports which may dampen quantities demanded of corn and its compliment, soybean meal, during the first half of 1985. U.S. soybean oil prices are expected to face downward pressure through mid-1985 because of expected increases in the world edible oil supply and the strong dollar.

Other Major Edible Oil Exporters

Argentina and Brazilian soybean production increased sharply during the last decade; however, recent supplies have been erratic due to production shortfalls and frequent changes in export policies. Both countries have recently had combined annual soybean oil production of about 2.7 million tons, about 20 percent of the world supply. Although the U.S. remains the single largest soybean oil exporter, Argentina and Brazil have a combined larger share (35 percent) of the export market. At the end of August, 1984, Brazil removed agricultural marketing from any government interference, except, however, for a few safeguards intended to protect the domestic market.

These safeguards are to be set within a 40-day period of time. The initial reaction was favorable, but data on farmers' trends indicate a reduction of 10 percent in the total acreage to be planted to soybeans as a result of the high cost of production, including interest rates estimated at 18 percent.

Brazil has committed or shipped a high proportion of its current crop according to the export registrations recorded by the Brazilian export agency. As of August 13, 1984, there is open for registration slightly less than 200,000 MT of soybeans, 1.0 million MT of SBM and 100,000 MT of soybean oil.

It is expected that Argentina will crush a larger share of its soybean and sunflower production because of a substantial increase in new crushing capacity.

Weather or financial problems in South America will have to be closely monitored. USA soybean exports could increase as a result of conditions in Brazil, Argentina and Russia until such time as South American production is assured in March/April 1985.

During the past decade, palm oil emerged with a significant share of the world oil export market. African palm production has stagnated while Malaysian and Indonesian supplies have led palm oil market expansion. Malaysia's palm oil industry has been particularly aggressive. The Malaysian government has created favorable tax and investment opportunities for palm oil plantations and refineries. Recent palm oil cultivation advances have pushed yields to successively higher production frontiers. The recent introduction of the Camaroon Weevil improved pollination efficiency enough to raise yields about 15 percent. In many instances, the new technologies have created a new set of production problems. Palm oil production increased due to improved pollination, but the greater burdens on plant metabolism has meant a shorter production life for each palm tree (Tables 3-1, 3-2). In spite of these problems, palm oil production has been a dramatic success. Palm trees are being planted on former rubber plantations and jungle areas. The harvested area has been increasing at a rate of approximately 9.3 percent per year, which was used to estimate the 1984 harvested area. Malaysia represents 93 percent of the total production of palm oil. The 1984 estimated annual increase of 686,000 MT is equivalent to 137 million bushels of soybeans.

TABLE 3-1. MALAYSIAN PALM TREE YIELDS

Year	Hectares	Crude Oil Production (Million Tons)	Tons/Hectare
1981	720,000	2,645	3.67
1982	786,000	3,252	4.14
1983	860,000	2,783	3.24
1984	940,000	3,469	3.69

TABLE 3-2. MALAYSIAN PALM OIL PRODUCTION

Year	(000 Tons) Production	Change of Previous Year	
1973	739		
1974	942	+203	+27%
1975	1137	+195	+21%
1976	1261	+124	+11%
1977	1484	+223	+18%
1978	1640	+156	+11%
1979	2033	+393	+24%
1980	2397	+364	+18%
1981	2645	+248	+10%
1982	3252	+607	+23%
1983	2783	−469	−14%
1984	*3348-3484		

*Range of estimates from USDA May, 1984, and *Oil World* forecast June 15, 1984. The 1984 production estimate is set at 3,469 thousand tons based on the increase in Ha harvested and the yield average for 19811982-1983.

Recent shortfalls in Malaysian palm oil production, along with the small U.S. soybean harvest, pushed palm oil prices into the range of $900 to $1,100 per ton during the first quarter of 1984. The current outlook is for sharp increases in palm oil production through 1985, pushing oil prices down to the $500-550 per ton range during most of 1985.

Consumption

Rising incomes and new processing methods have expanded the range and magnitude of edible vegetable oil consumption. Differences between food demand trends in developed and less developed countries have important implications for future world edible oil price trends.

Developed Nations

Edible oil demand changes in developed nations are more responsive to population changes than to price or income changes. Price and income elasticities of edible oil demand are generally inelastic while population has a unitary elastic influence on demand. Dietary intake is generally sufficient. Variation in the composition of edible oil intake between countries generally reflects relative local consumption of animal and vegetable products, rather than sharp differences in total oil and fat consumption. In Western Europe, total daily consumption of fats and oils is about 150 grams per capita, of which about one-third is vegetable oils.

E.E.C.

The current European recovery lags significantly behind the upsurge in the American economy. Meat consumption has been static. Compound feeds and imports of feed ingredients such as soybean meal will likely be areas of low growth. With new quotas established on dairy production, large numbers of dairy cattle are either being slaughtered or, at the very least, put out to graze. The drop in cattle food production has freed more grain to the market, which will affect the amount of grain versus soybean meal going into poultry rations. Tapioca imports are strictly limited from 5.3 million tons last year down to a current quota of 4.5 million tons with a 10 percent tolerance. Assuming the tolerance will be exercised, the 350,000 ton drop will be detrimental to the consumption of soybean meal.

Non-grain feed ingredients (NGFI) enter the EEC at premium prices. If the price of soybean meal falls, the value of NGFI will drop until it hits the level at which consumption is assured. Although NFGI was already playing an important role in compound feed, the tapioca market was free. Cheap meal and tapioca enjoyed an advantage over community grain, but this is no longer true. The EEC needs to press more community produced grain and oilseeds into domestic markets, which will be detrimental to further soybean meal imports.

The EEC is allowing generous crushing subsidies for rapeseed and sunflower. Rapeseed meal is currently about 60 percent of the price of soybean meal and is beginning to move into hog rations resulting in less use of soybean meal.

USSR

The USDA on September 12, 1984, reduced its USSR crop estimate from 180 million MT to 175 million MT, compared to a Soviet target of 230 million MT. Some market analysts have predicted lower production and it is still possible that USDA will further reduce the production estimates in later reports. At this time, it is apparent that the USSR has had another serious shortfall that will require imports near the maximum capabilities of their ports, transportation and storage facilities. The latest USDA estimate is that the USSR will import from all origins 43 million MT of grain and oilseeds.

The USSR surprised the trade by beginning its buying programs well in advance of normal. As of September 6, 1984, the USSR has purchased 7.4 million MT of corn and 1.4 million MT of wheat. The Long-Term Agreement between the US and the USSR called for a 12 million MT limit, which apparently has been recently increased by 10 million MT to 22 million MT for 1984/85. Table 3-3 shows the schedule of Soviet grain transactions verus long term agreement terms and expanded limits. The USSR has generally taken amounts over the original L.T.A., and there are now some estimates that there will be imports as high as 20 million MT from the United States during 1984/85.

During the past year, the USSR also purchased approximately 400,000 MT of USA soybeans and soybean products from Brazil and also procured finished compound feeds from various E.E.C. countries. At this time, there is much conjecture as to why the USSR is not buying soybeans and, in particular, soybean meal since there is no question of its value for feed purposes. Analysts suggest that the Soviets are unable to handle and/or utilize soybean products in an efficient manner or do not wish to become dependent on a product that they have little likelihood of being able to produce. If the USSR continues to buy corn and wheat, any appreciable purchase of soybeans, soybean meal or soybean oil would reduce the generally bearish attitude toward the soy-complex.

TABLE 3-3. USSR LONG TERM GRAIN AGREEMENT VERSUS LTA TERMS & EXPANDED LIMITS
(million metric tons)

LTA Year	LTA Terms Minimum	LTA Terms Maximum	Additional Offered	Total Offered	Purchased-Shipped Corn	Purchased-Shipped Wheat	Purchased-Shipped Total
1976/77	6	8	7	15	3.0	3.1	6.1
1977/78	6	8	7	15	11.1	3.5	14.6
1978/79	6	8	10	18	11.5	4.0	15.5
1979/80	6	8	17	25	4.9	3.0	7.9*
1980/81	6	8	6	14	5.7	3.8	9.5
1981/82	6	8	15	23	7.8	6.1	13.9
1982/83	6	8	15	23	3.2	3.0	6.2
1983/84	9	12	10	22	6.6	7.4	14.0**

Notes:
* Result of 1980 grain embargo. The USSR had nearly reached the maximum when embargo was declared.
** Preliminary.

Developing Nations

Edible oil demand continues to be explosive in developing countries. In most countries, demand is much more responsive to income changes than to price changes. Price elasticities of edible oil demand have usually been estimated in the −0.4 to −0.8 range (price inelastic). Most edible oil income elasticities have been estimated in the 1.1 to 1.5 range (income elastic). Most increases in edible oil demand have been due to income growth and strong trend factors that include the effects of discovering new ways of consuming edible oil products. Pakistan's total daily fat consumption is about 42 grams per capita, of which about 25 grams (60 percent) are provided by vegetable oils. In contrast to Pakistan, vegetable oils are a much higher proportion of fat intake in most developing countries.

Future Price Trends

Population growth alone points to continued strong world demand for edible vegetable oils. Two-thirds of the world's population lives in or near poverty and spends a larger portion of additional income on edible oils than in developed countries. In most developing countries, severe livestock shortages leave vegetable oils as the major source of edible fats and oils.

With edible oils, like most agricultural commodities, demand varies less than supply. Agricultural policies in most developing countries create significant economic disincentives to expanded livestock and edible oilseed production. Weather continues to be one the greatest sources of instability in agricultural production. Finally, agricultural and trade policies of major food exporting countries are even less predictable than the weather.

Palm oil supply exhibits erratic behavior that is typical of new, emerging industries. Although its supply has been volatile, strong demand has permitted palm oil to gain a significant share of the world edible oil market. Further evidence of its importance in the world market is the general upward trend in palm oil prices.

Soybean oil prices trend upward (See Annex E, Tables E-1, E-2 and E-3) and there is little chance of a dramatic soybean breeding breakthrough during the next two decades. Soybean production has a larger production experience base than palm oil, but market history reveals about three sharp, shortage-induced price peaks each decade.

Pakistan's import experience between 1971 and 1982 provides useful insights into world edible oil trends. During that period, the average annual price of imported oil varied greatly, but the compound annual growth rate was approximately 6.7 percent (Annex E, Tables E-6 and E-7). At this rate, Pakistan can expect the average price of imported oil to double every 10 years. Since edible oil imports are projected to increase at an annual rate of 10 to 13 percent (Table 2-2), there should be considerable interest in minimizing future edible oil import costs by improving the country's edible oils stock and trade management system.

CHAPTER IV

EDIBLE OILS PROCESSING, STORAGE AND HANDLING REQUIREMENTS

Oilseed Crushing Requirements

The Sixth Plan target areas for production on non-traditional oilseeds in Punjab and Sind are good crop producing areas and are near existing solvent oil seed processing plants. Six plants in Sind are located at Karachi, Hyderabad and Nawabshah. Five plants serve Punjab at Multan, Burewala and Faisalabad. Another mothballed plant is located at Lahore. These plants are conveniently located for oilseed processing.

There are no suitable processing facilities for non-traditional oilseeds in NWFP. However, if an oilseed program were successful, it is anticipated that private sector planting seed operations would develop in NWFP for distribution to other provinces. Soybean planting seed, for example, must have air conditioned storage if held in Sind or Punjab during periods of high temperature.

Although Pakistan has approximately 4 million tons of crushing capacity, the total annual crush is only about 1.75 million tons. Solvent capacity is about one-half million tons, of which about 200,000 tons are used annually for cottonseed, rice bran and rape cake processing.

If all of the cottonseed had been processed at solvent plants in recent years, cotton oil production would have been increased from about 135,000 tons, on average, to nearly 180,000 tons (33 percent increase) through improved extraction. However, expeller plants are conveniently located and are so cost effective under current market conditions that the value of the increased production of oil at solvent plants does not off-set the higher transportation and solvent processing costs.

Although it contains hulls and lint, the cottonseed cake produced at expeller plants is preferred by farmers to meal produced at solvent plants because of the high oil content of the cake. Solvent extraction (after dehulling) of cottonseed is limited to the tonnage of meal that can be sold to the emerging poultry industry at a premium price.

The sharply reduced cottonseed crush in 1983-84 resulted in shortages of cotton oil and cake. The Karachi price of cake advanced about 69 percent from about Rs 1.70 per kilogram in February, 1983, to about Rs 2.90 per kilogram in July, 1984, while the oil procurement price increased only 28 percent (from Rs 250 to Rs 320 per maund) during the same period.

The cotton shortage also affected the profitability of sunflower oil. Spot sunflower meal prices rose from about Rs 2.25 per kilogram in 1983 to about Rs 3.5 in mid-1984, allowing oilseed crushers to pay more than the current sunflower support price (Rs 150 per 40 kilograms). Cake and meal prices are expected to decline with the return of a more normal cotton supply situation which will reduce sunflower profitability.

The GCP oilseed promotion program which began in 1978 has not been successful, partially because it circumvented the existing market infrastructure serving the farmer. As a result, oilseed collection was not assured and payments for collections were often delayed for two months and longer.

The industrial development schedule for The Sixth Five-Year Plan calls for an additional 50,000 tons of extraction capacity, requiring an investment of Rs 150 million. In the short run, it is not likely that this additional capacity will be needed in view of the existing under-utilized solvent extraction capacity in the private sector and the lack of progress to date in increasing production of non-traditional oilseeds.

Oil Refining Requirements

There were 26 vegetable oil refineries in Pakistan when the industry was nationalized in September, 1973. Three foreign-owned units were not nationalized. The remaining 23 units became the property of the GOP, and

management was taken over by the provincial governments. In June, 1976, the GCP (Ghee Corporation of Pakistan) was formed under the Ministry of Industries to take over the management of the nationalized plants and the industry from the provincial governments. Since 1980, 19 additional sanctioned units have been operating in the private sector (Table 4-1).

Production

Edible oil processing and handling capacity in Pakistan has had to grow with the rapid rise in vegetable oil consumption. Vegetable ghee capacity has grown at a 10 percent compounded annual rate in recent years. Production at GCP locations has increased at a compound annual rate of about nine percent since 1976-77. The private sector plants now total 23 on-stream or sanctioned, and production has grown at about 15 percent per annum during the same period. Eleven sanctions were granted for private sector plants with capacities of 9,000 tons each. The private sector share of production at all plants supplied oil by the GCP has increased from 12.1 percent in 1976-77 to 15.8 percent in 1982-83 (Table 4-2). The GCP announced plans to denationalize seven unprofitable plants in 1983; however, only two of the plants (in Lahore) are now closed, leaving 24 plants operating by mid-1984 (Annex D, Table D-1).

TABLE 4-1. TOTAL OPERATING AND SANCTIONED VEGETABLE GHEE PLANTS

Sector	1973	1980	1984
Public	23	25	24
Private	3	4*	23*
Total	26	29	47
Province			
Punjab		16	21
Sind		9	14
Baluchistan		1	3
NWFP		3	7
Azad Kashmir		0	2
Total		29	47

Notes: * Includes one plant owned by Army Welfare Food Industries.

Source: Annex D, Table D-5.

GOP policy has permitted private traders to import liquid vegetable oil directly rather than through a government import agency. Prior to mid-1983, the TCP (Trading Corporation of Pakistan) imported for the GCP. The TCP collected a variable import tax when the landed price was lower than the domestic procurement price. During 1982-83, the landed cost of oil was nearly $100 per ton less than the interior controlled price which encouraged direct imports primarily of palm oil, but also soybean oil.

After mid-1983, the GCP assumed all oil import responsibilities for GCP units and sanctioned private sector plants. Because import prices have exceeded the domestic procurement price since mid-1983, all sanctioned private plants have chosen to purchase oil through the GCP at the controlled interior (subsidized) price. Imported palm oil

is refined, deodorized and bleached (RDB) and has the appearance of vegetable ghee. Prior to mid-1983, palm oil was distributed without additional processing and without paying the ghee tax, in competition with vegetable ghee. This practice distorted the supply pipeline, exaggerated the consumption statistics of liquid oil and distorted the apparent edible oil processing capacity. Actual imports of oil are understated in the GCP statistics by approximately 170,000 tons in 1981-82 and by approximately 255,000 tons in 1982-83. This additional volume was handled almost entirely by the private sector at sanctioned and non-sanctioned plants.

TABLE 4-2. GHEE PRODUCTION CAPACITY SHARES BY SECTOR FOR PLANTS SUPPLIED OIL BY GCP

Year	Public Sector % Share	Public Sector Tons	Private Sector % Share	Private Sector Tons	Total Tons
1966-77	87.9	293,500	12.1	40,500	334,000
1977-78	86.2	310,000	13.8	49,500	359,500
1978-79	86.5	325,500	13.5	51,000	376,500
1979-80	84.8	382,500	15.2	68,500	451,000
1980-81	85.8	442,00	14.2	73,000	515,000
1981-82	85.1	477,000	14.9	83,500	560,500
1982-83	84.4	500,000	15.6	92,500	592,500
Compound Annual Growth Rate		9.28%		14.76%	10.02%

Notes: These capacities are also reported in Annex D, Table D-3; however, they do not agree with other GCP-supplied statistics. In Annex D, Table D-5, private sector ghee production capacity is set at 191,500 tons. Data in Tables 4-2 and D-3 do not include ghee mills not supplied crude oil by the GCP.

Source. GCP.

When the import statistics are revised for the unprocessed palm oil represented as vegetable ghee (Table 4-3), the actual consumption of vegetable ghee increased at a fifteen percent compound annual rate since 1976-77.

The impact of the private sector activities in direct importing and distribution actually reduced GCP volume during 1982-83 by seven percent, while actual volume was surging upward (Annex D, Table D-3). During this period, GCP finished product inventories grew and plants slowed production. The GCP public and private sector oil supplied plants operated at higher average daily rates in recent years (Table 4-4).

Increased demand for GCP-supplied oil since 1982-83 was brought about by the sharp rise in landed oil prices in mid-1983. Private sector units were forced to turn to the TCP, and later to the GCP, for subsidized oil supplies. Imported oil prices began increasing during April-June, 1983, when the on-board ship stocks plus Karachi stocks were at seasonal low levels (Annex C, Table C-2 and Annex D, Table D-4). The production of palm oil was declining at that time and aggressive buying by Pakistan was a contributing factor in the rapidly advancing world oil price. Private sector units also made non-sanctioned purchases of cottonseed oil direct from oil mills. The GCP, by law, acquires all cottonseed oil as produced at oil mills; however, it acquired less than half the oil produced during 1983-84 (Annex A, Table A-1 and Annex D, Table D-2). This situation brought about drastic changes as reported by the Ministry of Finance and Economic Affairs on January 16, 1984, in its Edible Oils Aide Memoir for fiscal year 1984:

TABLE 4-3. ESTIMATED GHEE PRODUCTION BY NON-GCP SUPPLIED UNIT

	GCP Oil Supplied Units Production	STM Estimate Total Prod.	STM Estimate Non-GCP Supplied Prod.
	..... 000 Tons		
1976-77	334	329	−5
1977-78	359	364	5
1978-79	376	429	63
1979-80	451	473	22
1980-81	515	527	12
1981-82	560	699	139
1982-83	592	749	157
Compound Annual Growth Rate (%)	10.02	14.7	

TABLE 4-4. AVERAGE DAILY VEGETABLE GHEE PRODUCTION RATES

	Daily Rate of Prod. Tons	Incremental Change
1980-81	1497	
1981-82	1583	+6%
1982-83	1478	−7%
1983-84	2047	+38%
1984-85 (*Projected*)	2301	+12%

". . . In order to tackle the problem of misuse of the facility by the cooking oil industry, the Government inter alia, decided as under:

(i) The GCP may be allowed to import edible oil direct;

(ii) Solid cooking oil was subjected to the same rate of excise duty as applicable to the vegetable ghee;

(iii) All units engaged in the processing of edible oil be allowed to produce any product mix; and

(iv) Tins of liquid and solid cooking oil under the force of law, would state the ingredients as well as exact proportion of oil mix.

The cooking oil industry has accordingly been allowed to produce any product mix within the production capacity already sanctioned to them by the government. The requirements of vegetable ghee and cooking oil industry (both for public and private sector) for 1983-84 were considered in the Foreign Exchange Committee meeting held in May, 1983. The following parameters were adopted:

(a) PL-480, CCC Credit and Blended Credit imports shall be handled exclusively by GCP. Private sector units shall be allocated these imports on prorata basis in accordance with their sanctioned capacity;

(b) Cottonseed under monopoly control shall be procured exclusively by GCP and will be apportioned to the public and private sector units on prorata basis in accordance with their sanctioned capacity; and

(c) The private sector industry would import their balance palm oil directly. . ."

World oil prices have declined sharply since May and the landed price is now hovering just above the controlled domestic procurement price (Rs 320 per maund). The GOP is currently considering a revised policy that would require all private sector firms to buy their imported oil from the GCP. Should the GCP sell only to the sanctioned plants, approximately 56,000 tons of non-sanctioned capacity in the private sector will not have access to imported oil.

Capacity

The total edible oil processing capacity, on-stream and announced (including the 56,000 tons of non-sanctioned capacity) is 853 500 tons on a 24-hour day, 320-day basis, according to GCP (Annex D, Table D-5). It is clear that additional capacity must come on-stream in line with growth in consumption. It should be noted that about 759 thousand tons were refined during 1983 (Annex A, Table A-4), while 1984 requirements are projected as high as 849 thousand tons (Annex B, Table B-6). The geographical distribution of existing edible oil processing parallels the population distribution by provinces (Table 4-5).

TABLE 4-5. DISTRIBUTION OF OIL PROCESSING CAPACITY BY PROVINCE

	Percent of	
	Total Population	Total Capacity
Punjab	56.7	51.2
Sind	22.7	29.9
Baluchistan	5.1	3.4
NWFP	15.1	13.5
Azad Kashmir	?	2.0
Total	100.0	100.0

Source: GCP

Major gains in operating efficiency are achieved in the area of 30,000 tons of refinery capacity, while the average GCP plant capacity is only 20,250 tons (Annex D, Table D-1) and average plant capacity in the private sector is only 13,543 tons. The 9,000 tons plants are too small for economical operation and some were sanctioned in areas that do not have necessary infrastructure (power, roads, etc.) and are not likely to be built. The GCP contends that small plants have been sanctioned for remote areas to assure a stable ghee supply for local areas. This practice is questionable because it is estimated that 30 thousand ton plants have unit operating costs of at least Rs 1 per kilogram less than 9,000 ton units. Finished product transport costs from large, centrally located plants would not exceed Rs 0.6 per kilogram. Therefore, the savings in operating costs would easily exceed additional transport costs for remote areas.

All edible oil processing plants, including new private sector plants, are of old design and operated on a batch which is less efficient than more modern, continuous processing lines. A GCP official has said there is no cost justification for modernizing the old GCP plants, but he was surprised that the private sector plants have been fabricated entirely in Pakistan and have utilized boilers salvaged from old ships dismantled in the Port of Karachi area.

The GCP plants are much more labor intensive than the private sector plants and unit costs are higher. A recent comparison of manpower in two plants, each with 19,000 tons of capacity, in the public sector and in the private sector, found the private sector plant to be about five times more labor efficient than the GCP plant (Table 4-6).

TABLE 4-6. COMPARISON OF GHEE LABOR PRODUCTIVITY

Sector	Workers Employed	Annual Production per Employee
Public	600	35 tons
Private	100	190 tons

Source: USDA, *Pakistan's Edible Oilseed Industry.*

The GCP granted sanctions for the construction of cooking oil plants in the private sector for the processing and distribution of polyunsaturated liquid cooking oils in competition with vegetable ghee. This was done to encourage liquid oil consumption for health reasons and to reduce processing costs as well as to ease the demand for ever-increasing hydrogen capacity required for ghee production.

Hydrogenation capacity appears to be fully utilized and advertisements appear in the press for tender offers on additional hydrogenation equipment for ghee mills. Preliminary GCP import estimates based on preference for imported oils during 1984-85 includes 231,000 tons of soy and 471,000 tons of palm to optimize hydrogenation capability and to reduce processing costs. Current sanctioned, operating ghee and cooking oil capacities are summarized in Table 4-7.

TABLE 4-7. TOTAL GHEE AND COOKING OIL OPERATING PROCESSING CAPACITY, 1983

	Ghee Units	Cooking Oil Units (a)	Total Capacity	Share
	..... 1000 Tons			
Public Sector	486	0	486	65 %
Private Sector (b)	192	75	267	35 %
Total	678	75	753	100 %
Share	90 %	10 %	100 %	

Notes: (a) Cooking oil units are assumed to process mostly palm oil as vegetable ghee.
(b) Private sector data include sanctioned units not usually supplied by the GCP.

Source: Annex D, Table D-5.

Based on STM steady state projections of growth in vegetable ghee demand (Annex B), processing capacity requirements are projected in Table 4-8. These projections indicate that the vegetable oil processing industry will have to double its processing capacity by 1989 at an additional cost of $74 million (more than Rs 1 billion at Oct.

1984 exchange rates). During the 1989-1993 period, capacity will have to increase by 50 percent at an additional cost of $158 million. This presents an opportunity to modernize the industry and increase efficiency by incorporating new technologies in future expansion. Sanitation, material handling and processing systems can be greatly improved.

TABLE 4-8. PROJECTED ADDITIONAL OIL PROCESSING CAPACITY AND CONSTRUCTION COSTS

	Incremental Capacity	Total Additional Capacity	Total Processing Capacity	Estimated Annual Cost		Estimated Accumulated Annual Cost	
	1000 Tons			Million			
	(a)		(b)	$ (c)	Rs	$	Rs
1984	96	96	849	9.70	138	9.70	138
1985	100	196	949	10.10	143	19.80	281
1986	113	309	1062	11.41	162	31.21	443
1987	125	434	1187	12.63	179	43.83	622
1988	140	574	1327	14.14	201	57.93	823
1989	156	730	1483	15.76	224	73.73	1047
1990	174	904	1657	17.57	250	91.30	1297
1991	195	1099	1852	19.70	280	111.00	1576
1992	218	1317	2070	22.02	313	133.02	1889
1993	243	1560	2313	24.54	349	157.56	2237
1994	271	1831	2584	27.37	389	184.93	2626

Notes : (a) A 1983 base capacity of 753 thousand tons is assumed (Table 4-7). All of the base capacity is assumed to be capable of ghee production despite the GCP's classification of 75 thousand tons of cooking oil capacity.

(b) Processing capacity requirements are for vegetable ghee forecasts under the steady state scenario from Annex B, Table B-6. The cooking oil forecasts in Annex B are mainly mustard/rapeseed oils, which would not be processed with the cooking oil capacity listed in Table 4-7.

(c) Construction cost is assumed to be $101 (Rs 1,428) per ton of additional capacity, based on the Industrial Investment Schedule for the Sixth Five-Year Plan.

The vegetable oil processing industry has been nationalized for more than ten years. Government controls on oil imports and vegetable ghee price tends to discourage the private sector capital required to meet anticipated capacity demands. Thus far, attempts to denationalize seven of the plants have not been successful.

Oil Storage and Transportation Requirements

Storage at Karachi

Karachi storage capacity for liquid edible products such as vegetable oil and molasses is about 335,000 tons, which is adequate for current edible oil import levels. The quantity of storage capacity available to the GCP was 201,000 tons in August, 1984, compared to 161,000 tons in 1982. The present storage space appears adequate based on month ending inventories over the past four years (Annex C, Table C-2); however, PL-480 soybean oil shipments tend to increase inventories at the same time indigenous cotton oil is available up-country. Although GCP officials have suggested the need to spread PL-480 shipments throughout the year, available data do not indicate a serious storage problem.

Oil storage rates, including in-and-out changes and one month's storage, are based on the ability of terminals to perform load-out services. Rail tank car and tank truck load-outs cost about Rs 50 per ton. There is no stand-by charge. After one month, the storage rate is Rs .25 per day per ton, or about Rs 7 per ton-month, compared to

rates of the current equivalent of Rs 575 to 640 per ton-month in the New Orleans area. Rates are apparently sufficient to attract additional storage at Karachi and new storage has been built recently.

Oil storage turn-over rates at the terminal are generally 15 to 45 days. If longer storage periods were considered as part of buffer stock or hedging strategies, monthly carrying charges would be an important determinant of the optimum storage time. Carrying charges for oil storage depend on storage (rental) rates, prevailing interest rates (financial charges on the inventory value), and oil quality deterioration rates. The storage rate is an insignificant charge and prevailing interest rates (13-15 percent) are not prohibitive. Since oil storage turn-over rates are relatively high, there is little local experience with the longer term effects of storage on oil quality.

The rate of unloading from vessels to terminals reached record levels in mid-1984. During the first half of 1984 the volume of oil stored on ships was more than twice the usual level (Annex C, Table C-2).

Transportation

Oil is transported from terminals at the Port of Karachi by tank cars (rail) and tank trucks. Due to the short distance to units in the Sind and the small usage in Baluchistan, both provinces are served exclusively by tank trucks and together amount to about 30 percent of total Pakistan oil processing capacity.

The remaining 70 percent of capacity in Punjab and NWFP is served both by rail and truck. Truck transportation cost is nearly twice the cost of rail transportation, which should be an incentive to maximize rail shipments (Table 4-9).

TABLE 4-9. ESTIMATED EDIBLE OIL TRANSPORT RATES

Destinations from Karachi	Rs per ton. Tank Rail Cars (a)	Tank Trucks (Lean Period) (b)	Tank Trucks Peak Period) (c)
Faisalabad	226.98	425.94	448.37
Islamabad	316.81	554.16	583.22
Multan	203.45	354.56	373.24
Chichawatni	229.88	393.41	414.12
Lahore	273.31	464.55	489.02
Nowshera	306.74	599.04	630.55
Bara	327.79	615.72	648.14
Dargai	338.97	620.26	652.90
Haripur	342.27	582.15	612.81
Karachi	–	29.59	29.59
Hyderabad	–	96.26	96.26
Shikarpur	–	217.48	217.48
Quetta	–	377.40	377.40

Notes : (a) Tank car capacity is 19 tons.
(b) Tank truck capacity is 8-10 tons.

Source : Zahid, S.N. and S.A.H. Jagirdar, *The Storage and Transport of Edible Oil Imports in Pakistan*. Applied Economics Research Centre, Karachi University, October, 1983, p. 40.

In 1983/84, the GCP shipped 716,000 tons of imported vegetable oils to oil processing units in Pakistan. About 500,000 tons (70 percent) of imported oil moved up-country to Punjab and NWFP and theoretically could have been transported entirely by rail at the lower rail cost. Actual cost incurred by GCP was five to seven million dollars higher because of a lack of rail equipment and facilities. Because of relatively inefficient rail handling, tank trucks transported about 75 percent of the oil.

Unit trains consisting of 50 tank cars containing 19 tons each (950 tons) move from the Port of Karachi to four rail sidings up-country near major market areas at Multan, Faisalabad, Lahore and Nowshera. From the rail sidings, arrangements are made for tank truck distribution to several nearby nationalized ghee units. Rail shipments are made to nine units.

A loaded 50 car train travelling north may, for example, leave some cars at Multan and some at Faisalabad and continue on to Lahore as a final destination. The oil is decanted from rail tank cars to tank trucks for delivery at nationalized oil processing units in the area. The tank cars are held at the siding until all are unloaded. When the train returns south, empty cars along the route are collected and returned to Karachi for reloading. Travel time from Karachi to up-country destinations is from four to seven days. Decanting time is perhaps two days and the return leaving Karachi is eight to fourteen days and longer, depending on destination and not counting loading time. To move all of the oil up-country in 1983/84 would have required:

- Loading 72 tank cars per day.
- Loading 26,316 tank cars during the year.
- The equivalent of 526 trains consisting of 50 cars each.

By comparison, only about 20 to 25 tank cars are currently available to be loaded daily which would accommodate less than 30 percent of the oil shipped. In 1982, an average of 17.8 tank cars were loaded daily. However, based on the best performance over a four month period the rate was 21 tank cars per day. Assuming all of the 500,000 tons of oil moved to Multan by truck and an exchange rate of Rs 14.23/$1.00, the cost would have been $12.8 million (Rs 182 million) and if moved entirely by rail the cost would have been $7.2 million (Rs 101.7 million), a savings of $5.7 million (Rs 80.3 million).

Increased rail transportation could occur if more tank cars and locomotives were supplied; however, the GOP apparently does not plan to increase rail power equipment or tank cars. Unit trains for oil now have 50 cars, each holding 19 tons, for a total of 950 tons. (Unit trains for fertilizer haul 1500 tons utilizing 60 rail cars per train.)

Up-Country Storage

Storage tanks are needed at rail head destinations to optimize utilization of rail equipment. Two tanks would probably be required (one for soy and one for palm) at each of four rail heads which now distribute oil to ghee units. Assuming construction costs are $100,000 per tank, total cost would be $800,000 for four locations, not including land and utility costs.

The oil storage at oil processing units (58,000 tons) is equal to usage for about two weeks and is sufficient even with increased capacity if near-by rail head storage tanks were available in sufficient quantity. There are about 225 rail tank cars in the present fleet assigned to GCP. The capacity of the fleet is 225 cars holding 19 tons each, or 4275 tons. Annual rail savings due to reduced fleet turn-around times from Karachi to Multan are summarized in Table 4-10. Each train of 50 tank cars to Multan represents a freight saving of $10,900 (950 tons x $11.47/ton) compared to truck transportation costs to Multan.

Savings from reducing the fleet turn-around from eight to seven days would pay back the $800,000 storage investment in 2.5 years. Reducing the turn-around time an additional day (from seven to six) would reduce the payback period to 1.9 years. Running two additonal trains per month would save $261,600 per year, or an investment payback of about three years.

Under current transportation trends, the quantity of oil moved by rail will decline to about five percent of shipments to Punjab and NWFP by 1994, based on STM oil import forecasts. Future transportation savings will require private sector storage investments at the four locations and a strong GOP commitment to improve rail transport efficiency.

TABLE 4-10. EFFECT OF FLEET TURN-AROUND TIME ON RAIL OIL TRANSPORT SAVINGS

		— Million Dollars —			— Million Rs. —	
Fleet Turn-Around Days	Trip Annually	Tons (Trips x 4275)	Rail Savings @$11.31/T	Rail Incremental Savings	Rail Savings @ Rs 160.59/T	Rail Increment Savings
8	45.63	195,068	2.206	0	31.32	0
7	52.14	222,899	2.521	$ 315	35.79	4.47
6	60.83	260,063	2.941	$.420	41.76	5.97
5	73.00	312,075	3.530	$.589	50.11	8.35

Notes : Rail savings on Karachi-Multan deliveries are estimated as follows :

	. . . . . Average Per Ton	
	$	Rs.
Truck	25.63	364.00
Rail	14.33	203.45
Rail Advantage	11.31	160.59

CHAPTER V

EDIBLE OIL TRADING OPTIONS

The edible vegetable oil market presents significant opportunities for more effectively coping with international price instability, for reducing the foreign exchange bill associated with imports, and for liberating public funds now tied up to finance edible oil trade on a cash basis. Current trading operations were studied to identify approaches which would take advantage of these opportunities.

Current Importing Procedures

Imported oil trading procedures are an important influence on the trading efficiency of all domestically produced oils. Since non-traditional oilseed production is less than one percent of total production and most rape-mustard oil is consumed locally without additional refining and processing, the only other major domestic oil trading is confined to cottonseed oil. Since the Ghee Corporation of Pakistan is the only authorized wholesale buyer of crude cottonseed oil, its trading practices largely determine the level of price efficiency throughout the industry. Price efficiency is defined as how closely the market price at any one time reflects the real economic value (shadow price) of a particular commodity.

Role of the Ghee Corporation

The GCP also dominated the edible oil import market, where its trading methods dictate how most edible oil is imported. Prior to fiscal year 1983, all GCP oil import requirements were handled by the Trading Corporation of Pakistan. The TCP also was represented to be the sole importer of all edible oils, but there is considerable evidence that private oil refiners had relatively little difficulty in obtaining import licences and the necessary foreign exchange from the Ministry of Finance.

During most of fiscal year 1983, imported oil prices stayed above the government procurement price for crude cottonseed oil, even though the procurement price was raised from Rs 250 to Rs 320 per maund in November, 1983. The GCP imported oil for resale to all GCP plants and sanctioned private plants. Since the import price was above Rs 400 per maund for most of the year, the government paid a substantial subsidy to avoid upward pressure on retail vegetable ghee prices.

The GCP imports oil through its Oil Import and Logistics Division, headquartered in Karachi. The Import Branch compiles GCP and sanctioned private refineries' oil requests by amount and type of oil and expected delivery date. After reviewing available supplies of domestically procured cottonseed oil, the Import Branch posts tenders for sealed bids.

The GCP bidding procedure is similar to most government procurement methods. Dates of postings and bid openings are announced on a random basis within a particular requirement period. The Import Branch avoids posting tenders on the same day of the week to reduce bidders' opportunities to anticipate and rig their bids.

Bids are only accepted from agents registered with the GCP. Each agent must be certified as a representative of a principal oil supplier. It appears that brokers and other trading intermediaries are regarded as unnecessary middlemen whose commercial activity has no productive value. The "commercial" term is used to connote undesirable or unacceptable business practices when assessing duties on imported oil. If edible oil is imported for "industrial" use by refiners, it enters duty free. However, if the government classifies the intended use as "commercial," a 70 percent duty is levied. It is therefore not surprising that middlemen do not participate in the imported oil market, as only the direct oil users (refiners) can avoid the onerous import duty. This is unfortunate since commercial traaders could bring greater efficiency to the market, help save scarce foreign exchange and assume much of the risk and financial burden.

The GCP estimates that up to 60 palm oil agents and two dozen soybean oil agents maintain active registrations. According to current registration, 29 agents represent 44 principal palm oil suppliers (Annex G). The agent registration procedures may not prevent a few principal suppliers from creating multiple dummy front companies. If each dummy supplier submits a bid through its agent, the holding company is able to submit a range of bids for the same product. Therefore, a wide range of bid prices may be less a function of individual suppliers' true costs and profit margins than their ability to mask these "competitive" prices within a price spread that includes some excessive profit margins. About 20 to 30 bids are submitted for each palm oil tender while five to ten agents bid on each soybean oil tender.

Bids are received during the time period specified in the tender. Bids are opened in a public ceremony in the Import and Logistic Division headquarters at the time announced in the tender. Like most procurement programs, the GCP reserves the right to refuse the lowest bid if it has reason to suspect that the supplier would default. During the bid opening ceremony, all bids are announced to the audience which includes some or all of the bidders. After the bidding ceremony, the Import staff meets in private and reviews all bids and current international price quotations. If the GCP views the bids as too high, counter offers are made to each bidder. Successful bids are generally announced later on the bid opening day. Selected bidders are summoned to the GCP to sign a purchase agreement, which the GCP uses to apply for an import license and foreign exchange requirements.

The GCP monitors major international edible oil commodity exchanges, but that information is less valuable than it would be if there were vigorous competition among all edible oil refineries. The Import Branch subscribes to the APP and Reuters news and financial wires and various edible oils publications such as *Oil World Weekly*. Unfortunately, the value of this information is diminished if it is not used in a comprehensive market research program and correlated with other quotations for local oil landings.

The GCP records daily price quotations from the financial wires, but it does not have a price research capability. One reason why price research is not done relates to the nature of the GCP's buying pattern. The GCP essentially buys on the spot market where the longest delivery date is proportional to shipping distance. All contracts are on a cash-upon-delivery basis. The GCP does not deal in forward or futures contracts and will not voluntarily engage in such trading. In such circumstances, there is little financial incentive for the GCP to anticipate future changes in the spot market.

The lack of a competitive edible oils market in the private sector leaves the GCP with no other comprehensive, local measure of its price discovery efficiency (how well the bid price for imported oil to the GCP reflects the shadow price of that oil). Chicago soybean oil quotations are reliable, but the cost of non-U S. shipping are quite variable. In the case of palm oil, however, quotations on the Kuala Lumpur Commodity Exchange (KLCE) are much less reliable. In early 1984, several Malaysian palm oil traders defaulted on contracted deliveries. The KLCE is loosely regulated and increasingly distrusted by palm oil importers. The margins between crude and RBD palm oil quotations appear to be inconsistent at times. The KLCE temporarily suspended palm oil trading earlier this year because of major trading malpractices, particularly price manipulation.

The import licensing procedure requires up to two weeks. Once the Ministry of Finance approves the license, a letter of credit is issued for transmittal to the agent's home office. Suppliers do not release oil for shipment to Pakistan until their agents verify that a letter of credit has been authorized.

Shipping from Malaysia generally requires two or three weeks. U. S. soybean oil shipments require six to eight weeks.

Ocean tanker rates vary with general shipping supply and demand, but it is not clear how oil bids reflect least-cost shipping. Soybean oil shipping under PL—480 and other U.S. concessionary agreements generally costs about $80 per ton on U.S. flagships. Other shippers have delivered the remaining U.S. soybean oil purchases for as low as $35 per ton. In comparison, Malaysian palm oil is generally assumed to be delivered for about $25 per ton.

Private Sector Importing Practices

The GCP imported practically all of Pakistan's soybean oil and palm oil requirements last year. However, falling import prices may soon be well below the domestic procurement price. It is not clear how the GOP will respond to private refiners' requests to import cheaper oil directly without GCP assistance. In similar price situations in the past, the GOP did not prevent imports by private refiners.

If a private refinery chooses to import oil directly, it will face a market catering mainly to the GCP. Since import prices are not listed in a local commodity exchange or local daily financial publications, the private buyer must pay a significant price to search for the lowest deliverable price. The price discovery disadvantage is common to all buyers, including the GCP. With respect to size of purchases, however, the GCP may be able to command a lower price because it buys larger volumes than would be required for single firms.

Alternative Import Trading Procedures

Several changes in current edible oil importing procedures would improve market efficiency.

Foreign Exchange Transactions

Oil importers, whether public or private, generally have little difficulty in obtaining the necessary foreign exchange, but the import license concept should be clarified. The import license is presently issued in conjunction with the government's agreement to sell foreign exchange.

An alternative use of the import license would continue to handle the foreign exchange transactions, but simultaneously require the Ministry of Finance to charge an import license fee which would be the difference between the domestic oil procurement price and the lower import price. In cases where the import price exceeded the procurement price, no import license fee would be charged.

This new application of the import license would centralize government control over all edible oil imports, whether by public or private firms. The current practice of allowing private firms to import directly when the up-country cost of imported oil falls below the procurement price reduces or removes domestic oil production incentives. Oil refineries face supply crude oil price risks in both the domestic and import markets. Under the alternative import license concept, import price risk is absorbed by the license fee to yield zero price variability for low import prices. When the effective import floor price is the procurement price, the refinery should have the opportunity to bid for domestically produced oil at a price approaching the procurement price, minus extraction costs (about Rs 20 per maund of oilseed). This procedure would have the effect of shifting refiners' supply price risk away from the volatile world market to a domestic market that can be partially stabilized by forward production contracts between farmers and oilseed crushers.

Role of the Domestic Oil Procurement Price

There is very little economic rationale behind the current practice of setting the procurement price. As the import price plus landing and up-country transportation costs approach the current procurement price (Rs 320 per maund), a ghee mill is indifferent about domestic or imported oil except for the additional refining and hydrogenation costs of soybean, cottonseed, and non-traditional oils. The current cost disadvantage of imported oil is port landing costs of between five and six percent of the import price, plus up-country delivery costs of about Rs 360 per ton by truck or Rs 200 per ton by train (Table 4-10).

It is probably pure coincidence that the current procurement price is very near the forecast average import price based on the 1971-1982 trend (Annex E, Table E-6). If future annual procurement prices are set equal to that trend, much of Pakistan's edible oils balance of payments problem will be minimized. The application of the import trend would also give oilseed producers, oilseed crushers, and oil refiners an opportunity to make more realistic plans for future production. For wholesale oil buyers, the alternative import license concept and a procurement price

matched to the import price trend create powerful new incentives to use a wide range of hedging strategies to guarantee future deliveries of oil at reduced price risk.

A New Role for the GCP

The GCP's dominant position in the edible vegetable oil market clearly reduces price competition and reduces trading efficiency. If the GCP is denied moncpoly control over domestic cottonseed oil and all imported oil, price discovery will become more efficient. The GCP could continue buying oil by sealed bids, but increased competition by other refiners would strengthen all oil buyers' efforts to buy at the lowest deliverable price.

The Legal Environment for Commodity Trading Contracts

The status of forward and futures commodity contracts in Pakistsn is not clear. Any attempt to increase price competition would need to include provisions for sanctioning contracts between buyers and sellers throughout the wholesale edible oil marketing chain.

The present discrimination against edible oils brokers is not justified. Sanctions against trading malpractices are a proper role for government, but the absolute prohibition (through "commercial" tax levies) of traders and brokers is counterproductive.

Role of A Commodity Trading Institution

Finally, the wholesale edible oil market does not function efficiently because commodity trading is not supported and/or has actively been discouraged by the government in the past. In other countries, commodity exchanges serve as a clearing house for buyers and sellers and, based on changing market conditions, the competitive prices bid therein are an accurate reflection of the economic value of the commodity traded at a particular time. Should the GOP encourage and/or assist in the establishment of an eidble oils exchange, many of its recurring problems with pricing policy will become more manageable.

The process of establishing a commodity trading exchange should proceed with care. The prevailing bias against traders is deeply ingrained and counter-productive given the critical role they could play in coping with Pakistan's edible oil problems. Pakistan fortunately possesses substantial expertise in commodity trading techniques. In exploring the possibility of a commodity exchange, this expertise should be drawn upon to assist in identifying how such an exchange could provide maximum benefits and what steps need to be taken to establish it.

Futures Trading Principles

Futures trading is a highly organized method of forward buying and selling. Many government and business enterprises rely on this method because of its fundamental importance to maximizing the efficiency of the system for growing, storing, processing, and distributing agricultural commodities.

It is a standard aspect of contemporary financial practice that business and management "promises" become saleable to third parties. "Paper markets" are routinely accepted as necessary and desirable for the efficient functioning of governmental agencies, corporations and cooperatives. These markets are highly developed and dependent on specialized types of trading mechanisms. Because there is a potential for abuses, specialized regulations have evolved. Some of the more important safeguards will be described in further detail.

Early in the development of commodity markets, business firms engaged in wholesale buying and selling of the major agricultural commodities found it in their interests to band together into formal organizations for better daily trading. These associations became organized commodity exchanges and were formed in the main terminal market centers. They are run by committees of the membership and by elected officers. A certificate of membership (known as a "seat") has a value compared to the expected value of the services provided to the members. It is usual for the number of seats to be limited by the by-laws of the exchange.

The by-laws of an exchange govern the trading behavior of its members. Standards are set for fair dealing as further described and violaters are subject to punishment, suspension and/or loss of membersip.

About a century ago, trading in commodities for deferred delivery became a common occurrence. The initial futures markets in grains have been followed over the years by many other commodities and financial trading instruments. For example, the Chicago Board of Trade (CBT) was founded in 1848 and grew and diversified over the years into one of the best known commodity exchanges in the world.

Standard Contract Terms

The terms of futures contracts are standardized with respect to quantity, grade and location, time, and the method of delivery. This allows traders to get together on a trade and results in greater participation. The result of this standardization is that the traders only have to decide the price at the time of the business transaction.

Standard Trading Procedures

Anyone who wishes to buy or sell a futures contract can do so readily, but only through a registered brokerage firm. A local brokerage firm is usually represented on the various exchanges through officers or employees who are exchange members. Otherwise trades are placed through other brokers who hold memberships. Trading on the floor of the exchange is conducted by floor traders who represent various interests such as:

Processors	Speculators
Exporters	Financial Institutions
Importers	Domestic/International Firms
Commission Houses	Local/Terminal Elevator
Local Traders	

They stand in a "pit" or around a "ring," entering and accepting bids and offers by opening outcry and hand signals. The speed of the transactions, at times, appears frantic and leads to a certain mystique that futures trading has acquired because of its high degree of sophistication. Futures trading is further standardized by the time of day that contracts can be traded, minimum price of a transaction and the limit of price movement on any one day. The specific facts and figures for selected exchanges are summarized in Annex F.

When the delivery month arrives, contracts that have not been previously offset usually may be liquidated by delivery on any day at the seller's option, in which case prescribed procedures must be followed. All positions not liquidated on the final day of trading must be settled by physical delivery or be penalized for a default.

Security of the Contract

The integrity of futures contracts is secured by original or initial margin deposits that serve as escrow funds. The original or initial margin is usually ten to twenty percent of the full value of the commodity, although sometimes it may be less than ten percent. Maintenance margins are required to be deposited with the broker if the market moves in the opposite direction of the trade. This system of margins is further controlled by the broker's right to liquidate the position of any customer who fails to meet calls for additional margin money needed to cover adverse price moves. The additional money must be deposited with the broker prior to the start of the next day's trading. It is important to note that this ability to force liquidation should in most instances prevent the customer or the market from becoming over extended and would limit the extent of losses that would occur to the trader and his principal.

Just as customers must deposit margin funds with the brokerage firms, the brokerage firms must deposit margins with the exchange's clearing house. The clearing house, an association of the exchange members, is responsible for the integrity of each contract. It requires margin deposits of its members sufficient to back the contracts held by each. To insure unquestioned performance the clearing house becomes legal party to each and every

contract and, in this sense, becomes the buyer to every seller and the seller to every buyer. At the end of the trading day all contracts are submitted to the clearing house. At this time the clearing house becomes the opposite party to both sides of every transaction. The original buyer is associated with the clearing house as the seller; and the seller is associated with the clearing house as the buyer.

This clearing arrangement makes it possible for offsetting transactions to liquidate futures positions. If a seller wants to buy back a futures contract, he need not contact the original buyer. Rather, he simply would buy a contract on the exchange. Upon settlement of the price difference by a certified check, this purchase would offset the trader's original sale and remove him from the market. An opposite party to every contract exists but is unknown to each buyer and seller. Futures trading is a relatively safe system of trading from the standpoint of contract integrity and is very efficient in handling the transactions required. The prudent trader wisely offsets his position well before the last day of trading of a maturing future.

Regulation of Futures Trading

Each commodity exchange regulates trading to assure an efficient and equitable market. Each exchange employs a regulatory staff to prevent distortion of the market, false or inaccurate information and price manipulation. The government also regulates commodity exchanges. In the U.S.A. the Commodity Futures Trading Commission regulates commodity futures trading. The commission has broad powers that include:

- Regular investigation of the markets.
- Standards for licensing traders.
- Approving regulations, by-laws and rules of futures exchanges.
- Monitoring the financial stability of firms dealing in futures and protection of customer funds.
- Limiting the size of positions taken by any one trader or groups of traders.
- Defining hedging versus speculative trades.

Regulations help maintain futures trading as a reputable industry; however, abuses do occur. The abuse of most concern is price manipulation, one form of which is the "SQUEEZE." A squeeze occurs when an individual or group contracts a substantial portion of the open positions in a maturing future option as well as a substantial portion of the deliverable supplies and uses the combined position to alter the price. Prior to the turn of the century, squeezes of "corners" were fairly common. Exchanges soon learned that, to survive, they had to prohibit price manipulation tactics, but the temptation remains.

An Edible Oils Commodity Exchange for Pakistan

A Vegetable Oil Commodity Exchange could be modeled on the Cotton Exchange which existed over the years 1947-1974, and was second only to New York in terms of volume traded. Although different in scope, the Karachi Stock Exchange, from a legal and operating manner, could also be used as a model. The business community is aware of the workings of an Exchange and much of the legal work has been done. The study team has determined that there are sufficient traders and financiers available who are interested in participating in such an activity. The legal and formation requirements of an operating exchange could be assembled in a relatively short period. In short, such an exchange would offer many advantages to the procurement and trading of domestic and imported vegetable oils. Moreover, it is a practical option whose time has come.

Trading Structure

The market is currently well represented with approximately forty-four palm oil and eighteen soybean oil suppliers registered with the GCP (Annex G). Private traders, refiners, and oil storage operators could all utilize the market for hedging purposes. Jobbers and speculators generally are well informed students of the market who analyze the price making factors and buy when they think prices are too low and sell when they think prices are too high. Speculators and jobbers perform an important economic function by helping to provide broad and continuous markets. Speculators take the role of the risk bearer who assumes risks the hedger seeks to avoid.

Initially, trading could be proposed for soybean oil, palm oil and cottonseed oil. It is doubtful at this time that sunflower, rape or mustard oil would provide sufficient ovlume to justify their inclusion. If domestic production were to increase, inclusion of other oils would represent no problem.

The unit size for a contract of vegetable oil would be decided by the exchange and should be of the quantity that would suit the majority of traders. The unit for soybean oil at the CBT is 60,000 pounds, the original capacity of a standard tank car, and it has found good acceptance. Because most tank cars now have a 75 ton capacity, contracts are simply traded in multiples to cover the total position required by the traders.

Cottonseed Oil Trading Requirements

The development of a commodity exchange would require as a first step the end of the GCP monopoly status as the sole purchaser of cottonseed oil. This would allow the free market to determine the price on a daily basis relative to world prices for similar vegetable oils. The exchange must be allowed to operate with minimal government interference since other safeguards would be incorporated into the rules of the exchange.

The present GOP policy appears to be allowing the private trade to increase its market share. The GCP will be unable to cope with increased imports due to lack of funds for maintenance, up-grading current facilities, expansion and the building of larger, more efficient refineries.

PL-480 Soybean Oil Allocations

The purchasing of soybean oil as a result of PL-480 allocations and CCC credits is extremely important. The private trade will be more effective at importing oil at a reasonable cost if the government would obtain PL-480 authorizations as early as possible in the season. This would allow for a more flexible program in scheduling purchases and arranging the best shipping logistics to properly utilize the present storage facilities. Storage beyond sixty days can be costly due to the loss of oil quality.

Benefits of a Commodity Exchange

A commodity exchange would allow vegetable oils trading for nearby as well as deferred positions. This would spread the risks of the buyers and sellers over a year's time.

Although most future contracts are normally closed out prior to the delivery month, there are times when it is to the advantage of the buyer or seller to actually receive or give delivery. This would require establishment of approved locations for delivery which could initially be accomplished by using Karachi tank storage as an approved location. Cottonseed oil for delivery would normally be handled at the various refineries. The Karachi terminal and the refineries would enter into agreements with the exchange board to specify the necessary details of storage, quality and cost.

The long term success of the commodity exchange is difficult to predict at this time. The current volume of imported oil, coupled with the increase indicated in Table 2-2 will stimulate demand for improved trading. Various problems will arise in connection with the transfer of the GCP's buying program to a free trade market. It is certain that the private industry will endeavor to make the exchange successful because it will want to sell as much oil as the consumer will want.

A vegetable oils commodity exchange would have several advantages for the GOP:

- ability to spread the buying risk over a longer period of time;
- discover current, local prices more efficiently;
- reduce marketing costs due to current trading inefficiencies;
- possible implementation of other future commodity contracts such as rice, cotton and wheat;

- improvement in trading cash flows;
- attracting world traders to Pakistan with its potential for additional business activity;
- arbitrage for vegetable oils to utilize other markets in the U.S.A., London, Malaysia; and
- substantial savings in foreign exchange.

The current import program of the GCP is designed to take no market risks and only buy sixty days of oil consumption when the foreign currency is available. There is, however, an alternative trading strategy that would enable the GCP to save foreign exchange. For example, the July, 1984, future option at the Chicago Board of Trade traded from a contract low of 20 cents per pound on June 26, 1983, to a contract high of 39.89 cents per pound on May 21, 1984. If the GCP had made an early purchase on the Chicago Board of Trade futures or contracted with a cash seller for deferred delivery, they could have saved 19.89 cents per pound (assuming a purchase at the bottom of the market). It would be considered a good purchasing program if an average purchase price would have saved 10 cents per pound. This would result in a tremendous savings using 1983 consumption figures.

Total imports of soybean and palm oil during 1983 reached 721,000 MT, equal to 60,083 MT per month. If the above purchasing program bought one month's import requirement as soybean oil at a savings of 10 cents per pound, total savings would be $13.2 million. This is in contrast to the GCP's present program where buying is on a relative spot basis for the quantity required to protect a sixty-day supply.

It should also be noted that, in order to take advantage of buying on the futures market, protection could be established as margin money at ten to twenty percent of the full value of a contract.

The volatility of the vegetable oil market is the problem of any organization procuring oil for consumption purposes. The market is sensitive to a wide range of economic factors such as weather, wars, strikes, transportation availability and government actions, and the translation of all these factors into an accurate forecast of price action or movement is much more difficult.

A Commodity Exchange for Pakistan would have mirrored the same price volatility as the Chicago Board of Trade over the past years. A series of figures for soybean oil trading on the Chicago Board of Trade illustrate price variability over the long term and during recent months for four contract options.

Figure 5-1 shows a monthly price chart for soybean oil prices for the nearest futures month during the period 1961 -1984. The period 1961 to 1969 featured relatively stable prices due to the large surplus of grain and oil-seeds in the USA, which acted as a damper on prices. Since 1980, however, prices have varied from 16 cents to 42 cents per pound.

Figure 5-2 is easier to interpret because it only covers the period 1980 – 1984. The sharp price increases during the third quarter of 1983 and the second quarter of 1984 are particularly dramatic.

Figures 5-3, 5-4, 5-5, and 5-6 are charts covering recent prices at the Chicago Board of Trade for July, September, October and December contracts. The contract high and low is shown in the upper left hand corner of each schedule and in the case of October and December, they can still change before the liquidation or the last trading day, which is the eighth business day before the end of the calendar month. The charts also show the volatility of the market by showing the difference between highs and lows ranging from 7.5 cents to 19.89 cents per pound.

In Annex E, Table E-4 summarizes daily prices the GCP receives each day from the Associated Press of Pakistan. The GCP uses this market source to check the level of bids received from various suppliers for each tender. The extreme volatility of palm oil during the period December, 1983, to March, 1984, is a pure example of the high cost paid to purchase vegetable oils under present GCP policies.

FIGURE 5-1

SOYBEAN OIL - MONTHLY PRICE - 1961-1984

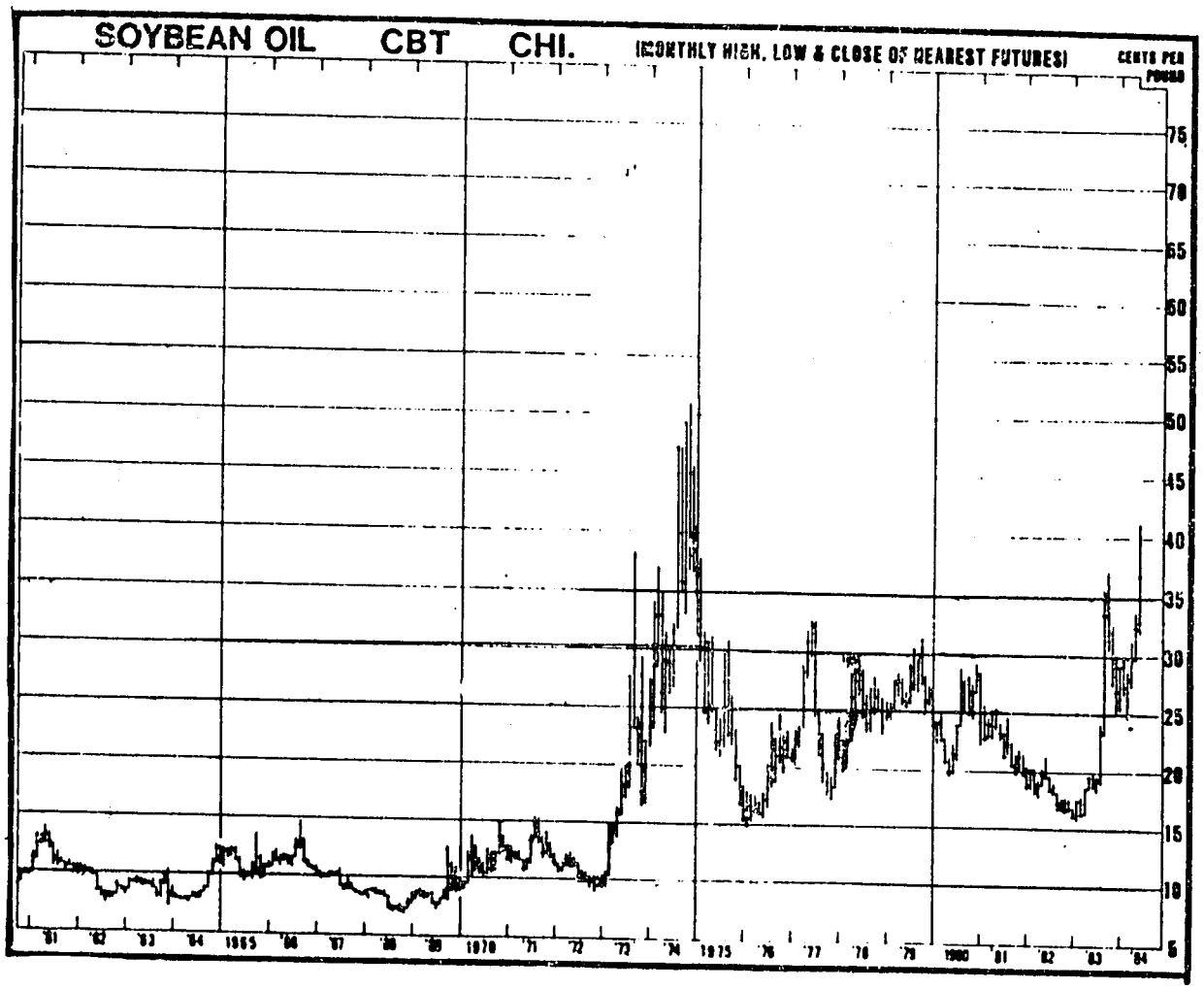


FIGURE 5-2

SOYBEAN OIL-PRICE BY YEAR BY QUARTER 1980-1984

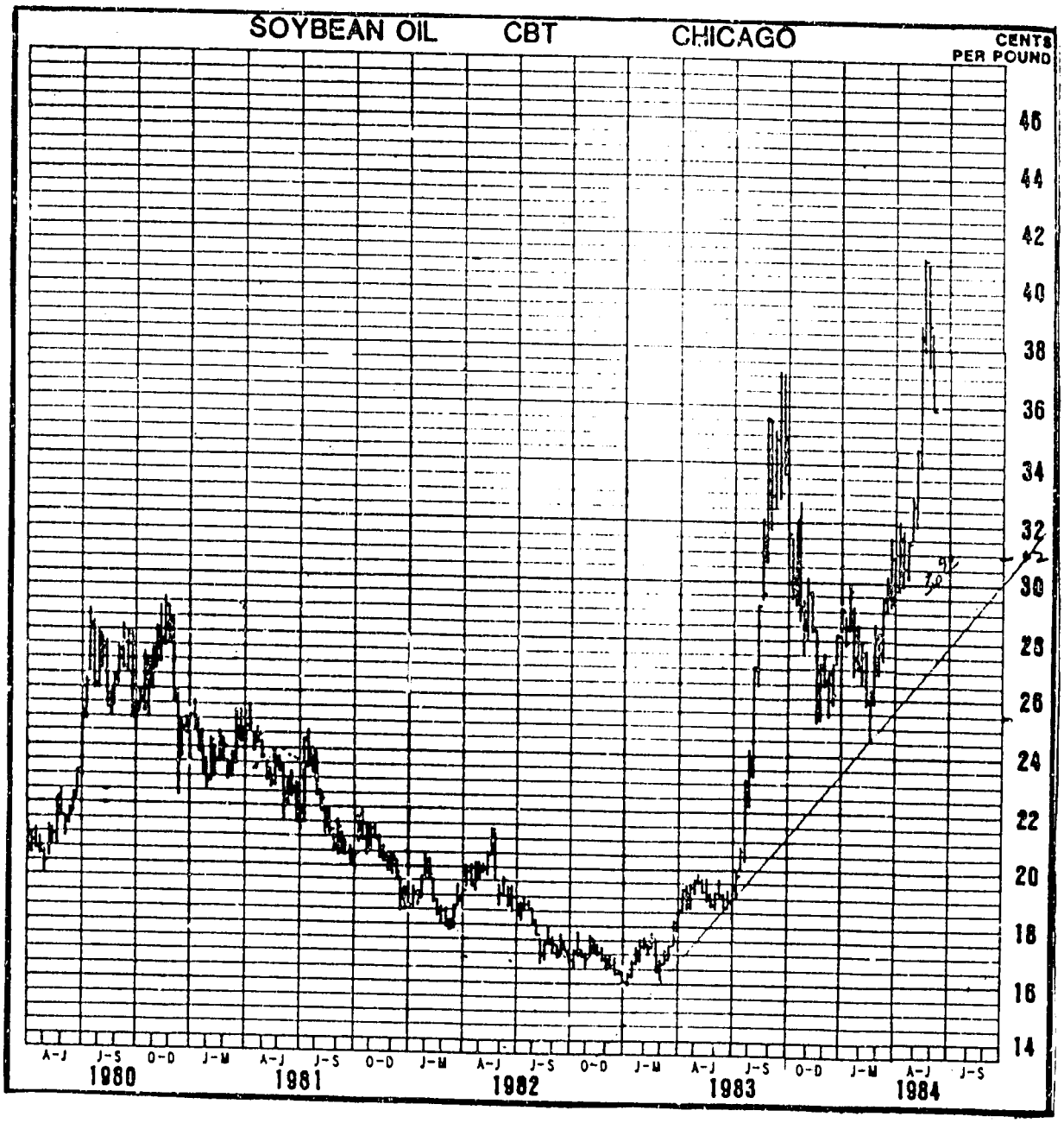


FIGURE 5-3

SOYBEAN OIL PRICE JULY FUTURES CONTRACT

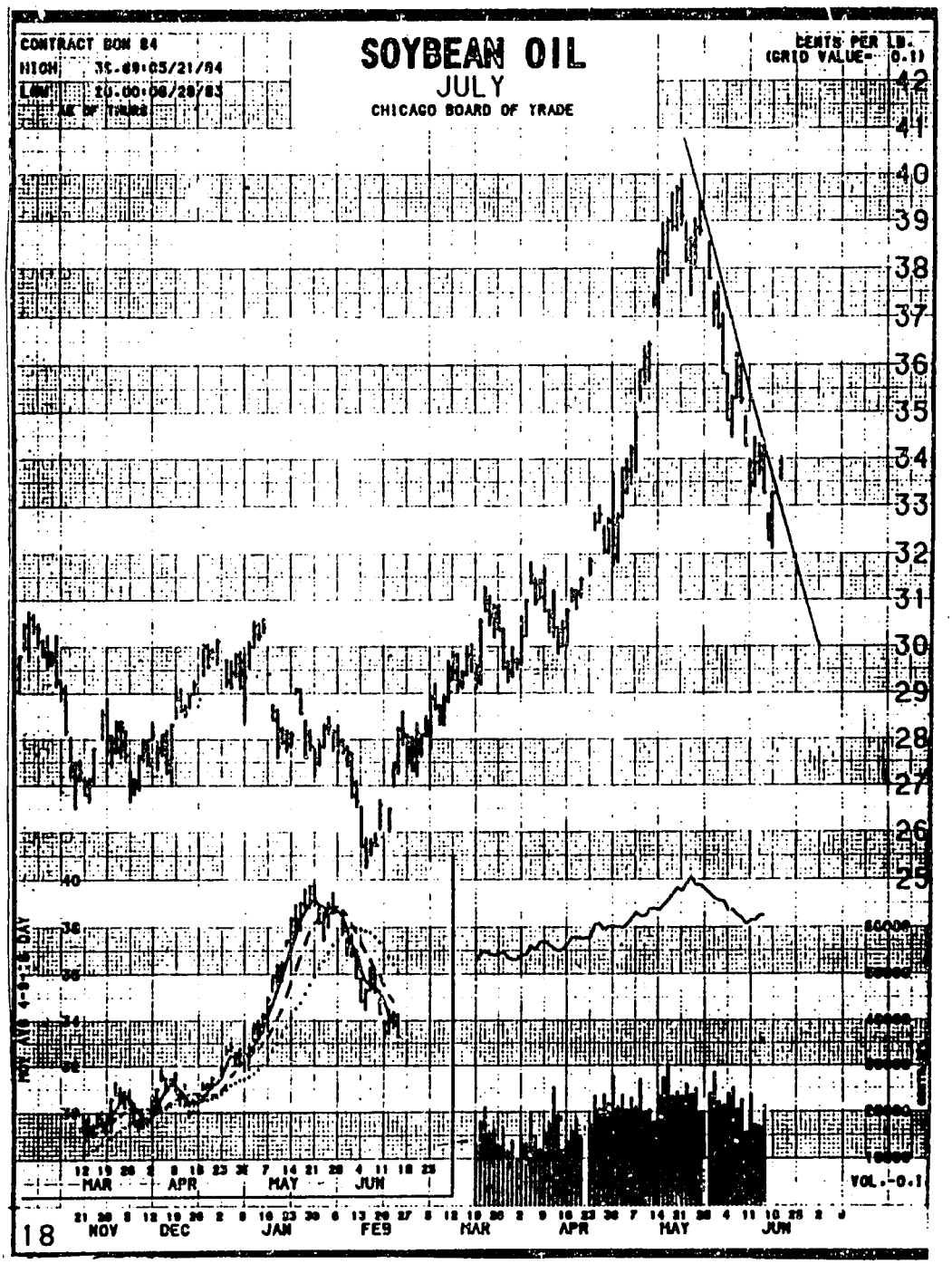


FIGURE 5-4

SOYBEAN OIL PRICE SEPTEMBER FUTURES CONTRACT

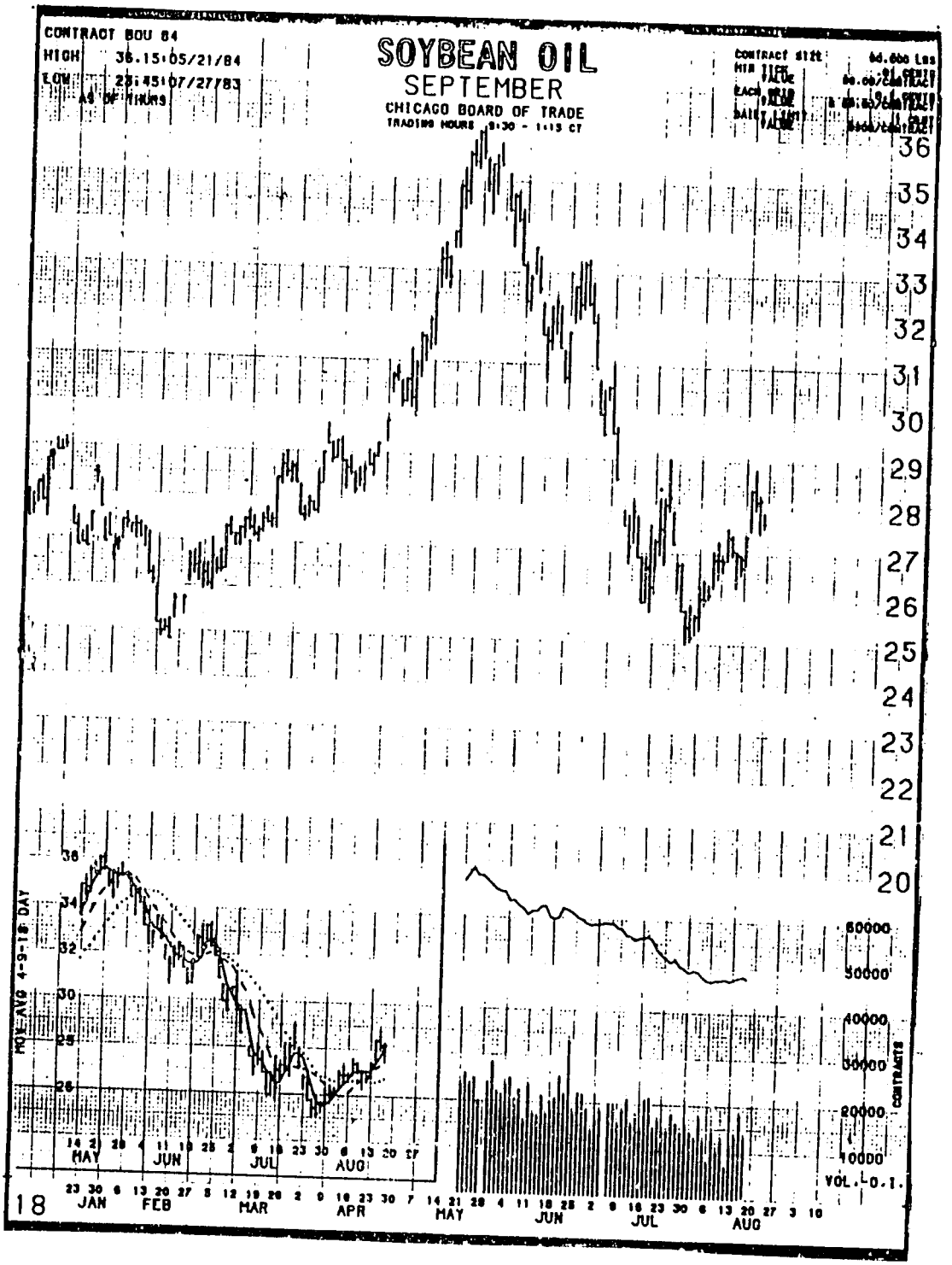
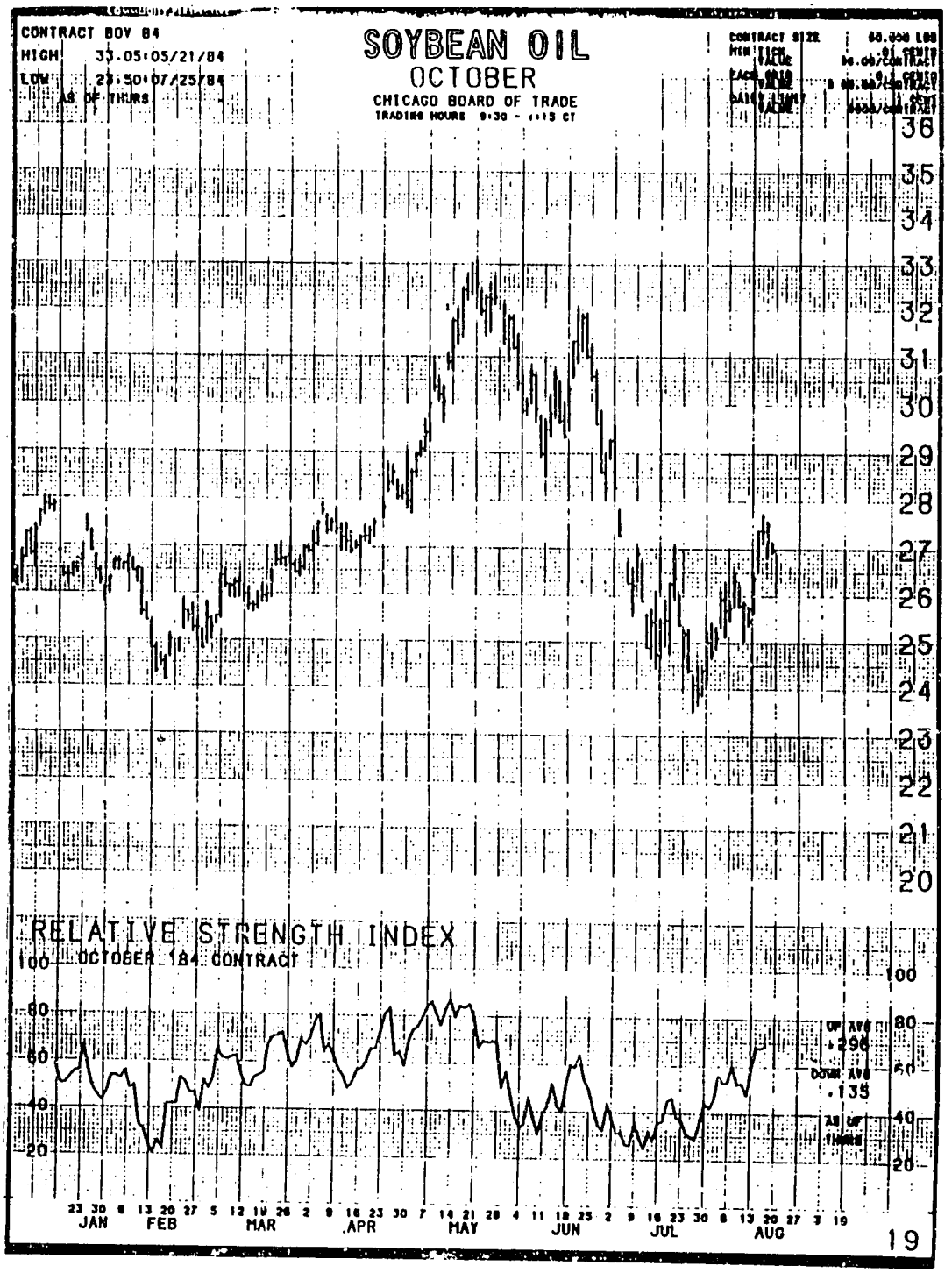


FIGURE 5-5

SOYBEAN OIL PRICE OCTOBER FUTURES CONTRACT



FUGURE 5-6

SOYBEAN OIL PRICE DECEMBER FUTURES CONTRACT

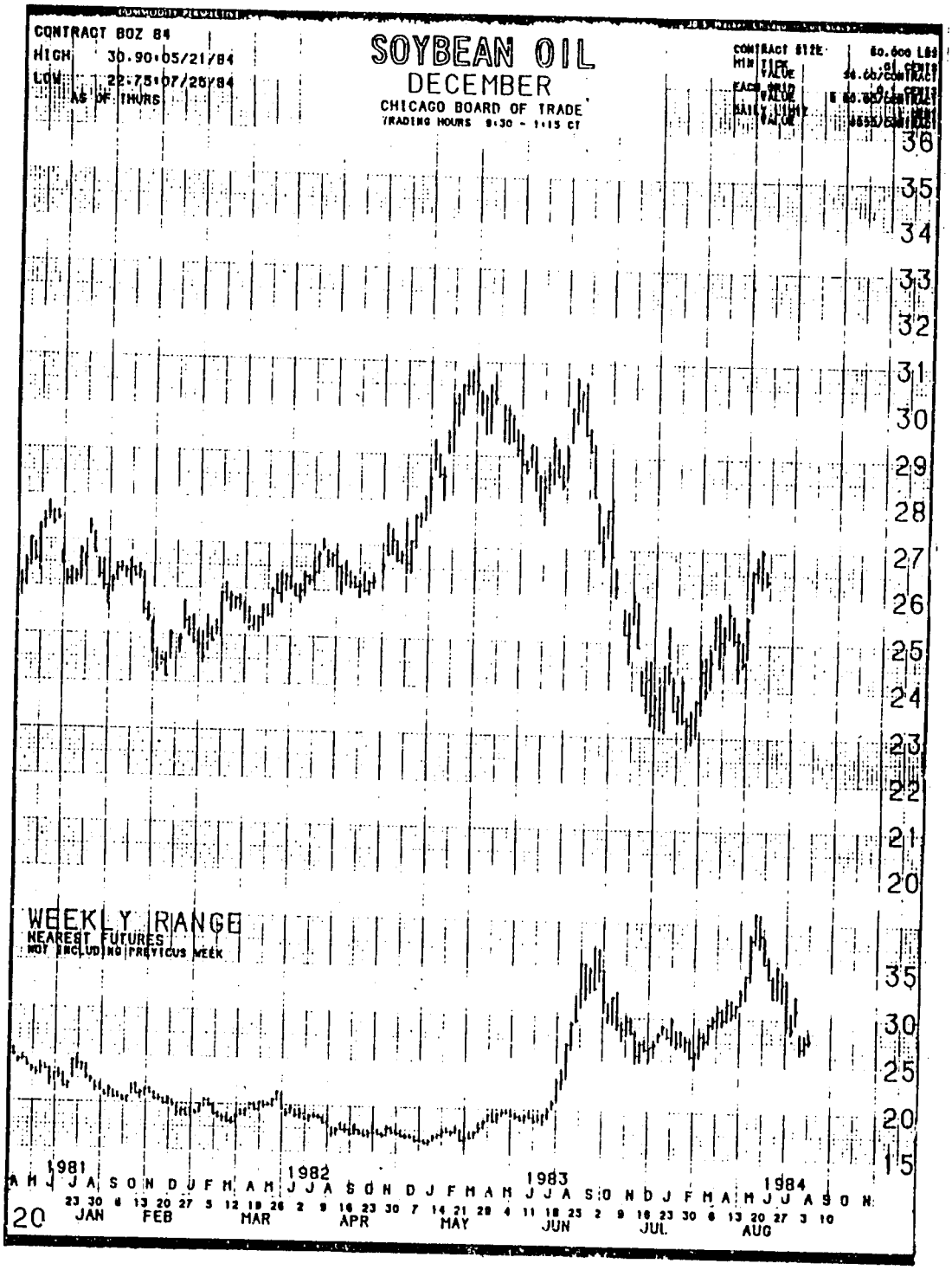


TABLE 5-1. VOLUME OF TRADING OF SOYBEAN OIL FUTURES AT THE CHICAGO BOARD OF TRADE IN THOUSANDS OF CONTRACTS

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1978	209	183	312	266	258	278	215	236	204	285	257	201	2,909
1979	215	291	233	254	212	321	313	252	262	311	222	191	3,082
1980	200	210	177	185	198	216	361	284	329	332	327	343	3,168
1981	243	231	237	254	221	274	355	233	240	235	228	292	3.047
1982	219	245	239	272	277	270	264	294	260	195	307	221	3,049
1983	273	244	264	273									

Source: Chicago Board of Trade.

TABLE 5-2. MONTH-END OPEN INTEREST OF SOYBEAN OIL FUTURES OF THE CHICAGO BOARD OF TRADE IN CONTRACTS

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	..... 1000's											
1978	40	44	49	49	55	52	52	49	50	60	57	54
1979	50	57	57	55	57	64	58	58	60	67	65	64
1980	62	63	59	52	61	65	64	63	66	75	91	71
1981	58	65	57	67	56	63	54	56	49	50	54	48
1982	53	53	49	53	57	58	56	50	44	41	45	50
1983	49	49	57	59								

Source: Chicago Board of Trade.

To be effective, commodity exchange markets must have liquidity or active daily participation and open interest that allows for easy entry or exit by the trader. Table 5-1 indicates the volume of trading of soybean oil futures at the CBT for the years 1978-1983.

Table 5-2 indicates the month-end open interest of soybean oil future at the CBT for the years 1978-1983. The daily volume and open interest are published after each closing and will alert traders to potential problems, depending on the future, in which they have a position. Volume of trading and changes in the open interest depending on past market prices could indicate traders adding to positions or liquidating.

If a decision is made to open a commodity exchange it would be instructive to have representatives of the CBT conduct a seminar for government and private traders to acquaint them and explain the futures market in the U.S.A. The team could be augmented by one or two traders to explain how they use the futures and answer traders' questions from a practical standpoint. The participants should include traders, government representatives, and finance, shipping, and market analysts.

A Hedging Example

The literature on futures markets often uses technical terms that confuse the layman. Unfortunately, many terms in futures trading are not defined in the same manner by all professional traders. A brief example based

on the 1984 CBT May soybean oil futures option will help clarify some of the terminology and demonstrate a specific application of hedging.

The Concept of Hedging

Commodity hedging is commonly defined as a producer's agreement to sell a given quantity (take a "short" position) for a fixed price at some time in the future, or a processor-consumer's agreement to buy a given quantity (take a "long" position) for a fixed price at some time in the future. This definition is popular because the hedging process is usually assumed to apply only to sellers' and buyers' attempts to avoid future adverse affects of cash prices.

Hedging, like all futures trading strategies, involves a decision rule "based" on the difference between a particular cash price and the price of a particular futures contract. Coincidently, the price difference, which is calculated as the cash price minus the futures price, is defined as the "basis." Each trader defines the basis according to his particular trading objective. The most common usage of the term refers to the difference between a particular cash price and a futures option price quoted on the same trading day. This type of basis is sometimes described as the "option basis."

Edible oils processors use hedging strategies to reduce risks on purchases that will be delivered at a future date. In this case, the processor's basis would be the difference between the expected cash price at delivery and the futures price for a delivery contract. This type of basis is sometimes defined as the "delivery basis."

Although hedging strategies usually attempt to minimize price risk, other hedging operations obscure the distinction between hedging and speculation. The major objectives of hedging programs can be summarized as follows:

* Eliminate Price Change Risks
* Reduce Price Change Risks
* Profit from Changes in the Basis
* Maximize Expected Returns for a Given Risk (or Minimize Risk for a Given Expected Return)

Pakistan's edible oils processors are primarily concerned with eliminating or reducing price change risks in buying each month's oil processing requirements. The benefits from a hedging program for edible oil purchases can be demonstrated more clearly by reviewing the results of cash versus futures trades for all combinations of cash and futures prices during the contract period.

The profitability of long cash trades versus long futures positions is summarized in Table 5-3. Two cash price movements, rises and falls, are compared over four relative futures price rises and four relative futures price falls. In four of the eight price situations, the unhedged, cash trades are unprofitable, relative to future price movements. However, only two hedged positions are clearly unprofitable (situations 2 and 8). Situation 7 also results in a loss from hedging, but the loss is less than for the respective cash trade.

Results of Hedges on May Soybean Oil Options

A more practical appreciation of the benefits of hedging strategies can be gained from a retrospective analysis of the 1984 May soybean oil option of the Chicago Board of Trade.

Daily cash and futures prices for January through May, 1984 (Annex H). were averaged by month to simplify a comparison of successive hedging positions during January-May. 1984. Table 5-4 presents a summary of average monthly cash and May futures prices and the average hedged savings on a delivery of 60,000 tons of soybean oil. The monthly trend price forecasted from Annex E, Table E-2 is included for an additional prespective on the cash-

futures price relationships. The delivery option basis for both March and May options was calculated to show the relative savings from taking delivery on either contract.

TABLE 5-3. PROFITABILITY OF ALTERNATIVE HEDGING SITUATIONS

Situation	Relative Price Movement		Results for Trader who is "Long" in the Cash Market	
	Cash	Future	Unhedged	Hedged
1.	Rises	Rises with cash price	Profit	No profit or loss
2.	Rises	Rises above cash price	Profit	Loss
3.	Rises	Rises, but below cash price	Profit	Profit, but less than "unhedged"
4.	Rises	Falls	Profit	Profit, but more than "unhedged"
5.	Falls	Falls with cash price	Loss	No profit or loss
6.	Falls	Falls below cash price	Loss	Profit
7.	Falls	Falls, but above cash price	Loss	Loss, but less than "unhedged"
8.	Falls	Rises	Loss	Loss, but more than "unhedged"

In January, 1984, the abnormally high May cash prices could not be predicted accurately. The trend prices suggested an historical variation of about one cent per pound over the five-month period. The January price of a May option was also within one cent of the May trend price and the January cash price. Because the May cash price rose to 38.12 cents, a May contract purchased in January would have had a delivery basis of 10.04 cents. When delivery was taken in May, the contract would have cost 10.04 cents less than the current cash price. If the May contract was for 60,000 tons (Pakistan's recent average monthly import rate), the January position would have saved over $13 million.

The relationships between the various cash, trend and May option prices are more easily placed in perspective in Figure 5-7. The vertical distance between the May cash price and all other May option prices measures the May delivery basis. Although the cash price trend is not sacrosanct, the movements of the cash and option prices demonstrate the practical wisdom of taking hedging positions near the trend line. The magnitudes of the potential savings from delivery of a May contract for 60,000 tons is presented in Figure 5-8.

TABLE 5-4. AVERAGE SOYBEAN OIL HEDGING SAVINGS ON MARCH, MAY, 1984 60,000 TON PURCHASES

Month	Cash	Trend	Contract Options			Basis					Delivery Savings on 60,000 Tons	
			Jan Opt	Mar Opt	May Opt	Jan Opt	Mar Opt	May Opt	Mar Opt	May Opt	Mar Del.	May Del
	Cents per Pound										Million Dollars	
	(a)	(b)	(a)	(a)	(a)	(c)	(c)	(c)	(d)	(d)	(e)	(e)
JAN.	28.32	29.01	28.26	28.34	28.08	0.06	−0.02	0.24	1.84	10.04	2.43	13.28
FEB	27.02	29.75		26.54	26.99		0.48	0.03	3.64	11.13	4.82	14.72
MAR	30.18	30.02		29.23	29.69		0.95	0.49	0.95	8.43	1.26	11.15
APR	32.01	29.94			31.33			0.68		6.79		8.98
MAY	38.12	29.90			36.54			1.58		1.58		2.09

Notes:

(a) Cash and contract option prices are monthly averages of daily data in Annex H.
(b) Trend prices are forecast from Annex E, Equation E-1, Table E-2.
(c) Each option basis for a particular month is the cash price minus the option price.

(d) Each delivery basis is the cash price in the delivery month minus the option price.
(e) Each delivery basis (cents per pound) is multiplied by 60,000 tons to estimate average savings realized by taking delivery on an option rather than buying in the cash market.

Commodity Consulting Considerations

The GOP may want to consider entering into a consulting type arrangement with an agribusiness firm in the United States which can provide market information, advice and counsel on financing, shipping, futures and cash oil markets on a continuing basis. The consulting firm may also act as an agent in certain types of transactions.

Because of the volatile nature of international commodity markets, vegetable oil importers of the magnitude of Pakistan must follow the markets closely to execute an efficient buying program. This could be accomplished by the use of a consulting firm that would by the very nature of its business already be doing the advanced planning or forecasting that is required. It has the highly specialized personnel to analyze the markets of internationally traded commodities. It would recommend a plan which would include cash market transactions and logistics, hedging techniques and basis trading. Consulting firms would be particularly helpful to Pakistan importers who have limited or inexperienced staff.

There are many excellent companies that could perform this function, although some could represent a conflict of interest. Various international trades are often the same firms that will be negotiating a price with the buyers for Pakistan. The agribusiness companies listed below are some of the largest in international trade. These are listed for illustrative and information purposes. The list should not be construed as a study team recommendation.

–	Archer Daniels Midland Co. Decatur, Ill.	Grain and Oilseed Processing and Trading
– *	N. V. Bunge, New York	Primarily Grains Trading
– *	Cargill Inc., Wayzata, Minnesota	Grain and Oilseed Processing and Trading
– *	Continental Grain, New York	Grain and Oilseed Processing and Trading
– *	Louis Dreyfus, Stamford, Connecticut	Primarily Grains Trading
–	I. S. Joseph Co. Inc., Minneapolis, Minnesota	Financial Management and General Commodity Trading
–	Philbro/Soloman, New York	Financial Managerment and General Commodity Trading

* Registered supplier of palm or soybean oil to Pakistan.

Consulting agreements could be designed for one year with options to renew for as long as three to five years, based usually on a percent of the total tonnage or value. Types of agreements could take the following forms:

(a) The consulting firm prepare buying/selling recommendations to the Pakistan buying entity.

(b) The consulting firm buys all of Pakistan's import requirements.

(c) A split percentage buying program could specify how the consultant and the Pakistan buying entity would each buy a certain percent of requirements.

(d) A long term agreement could use a deferred pricing system that normally incorporates a futures buying program, coupled with a basis for the differential between cash and the futures market. The basis is a risk that cannot be initially hedged and represents the difference between cash vegetable oil at an origin point (for soybean oil usually Decatur, Ill.) to the corresponding futures option. During the crop season the basis tends to follow predictable patterns. Normally the basis would be the widest at harvest

FIGURE 5-7

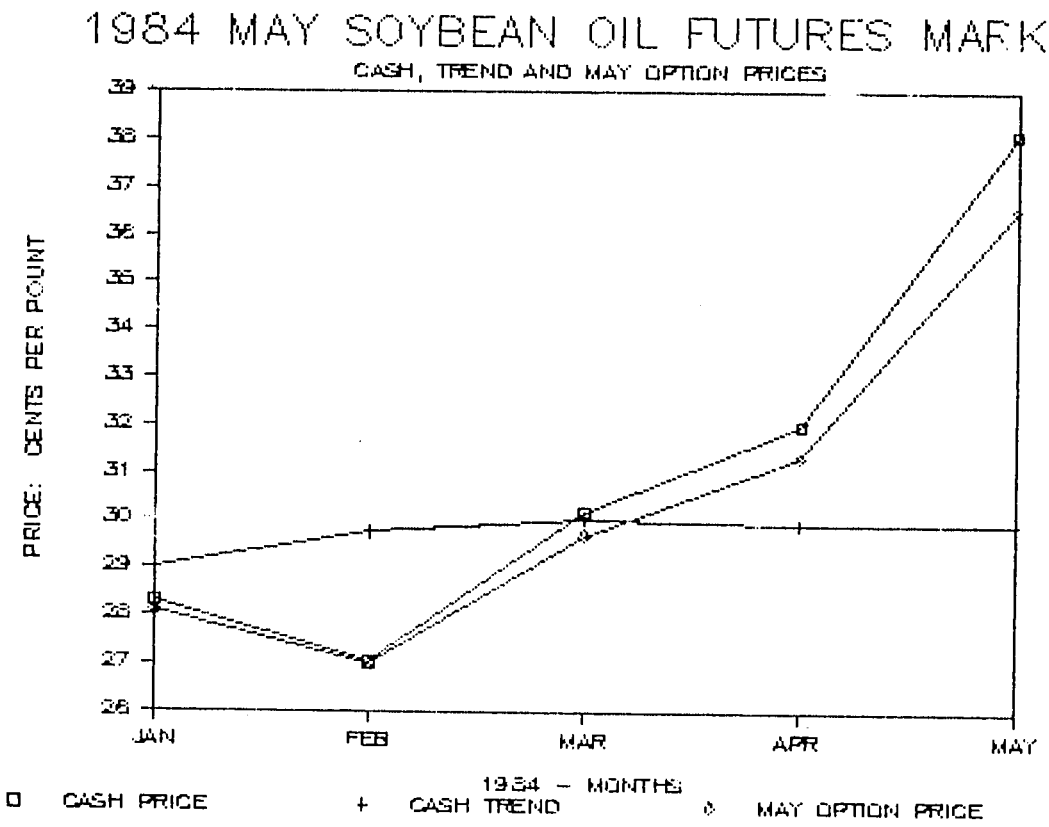
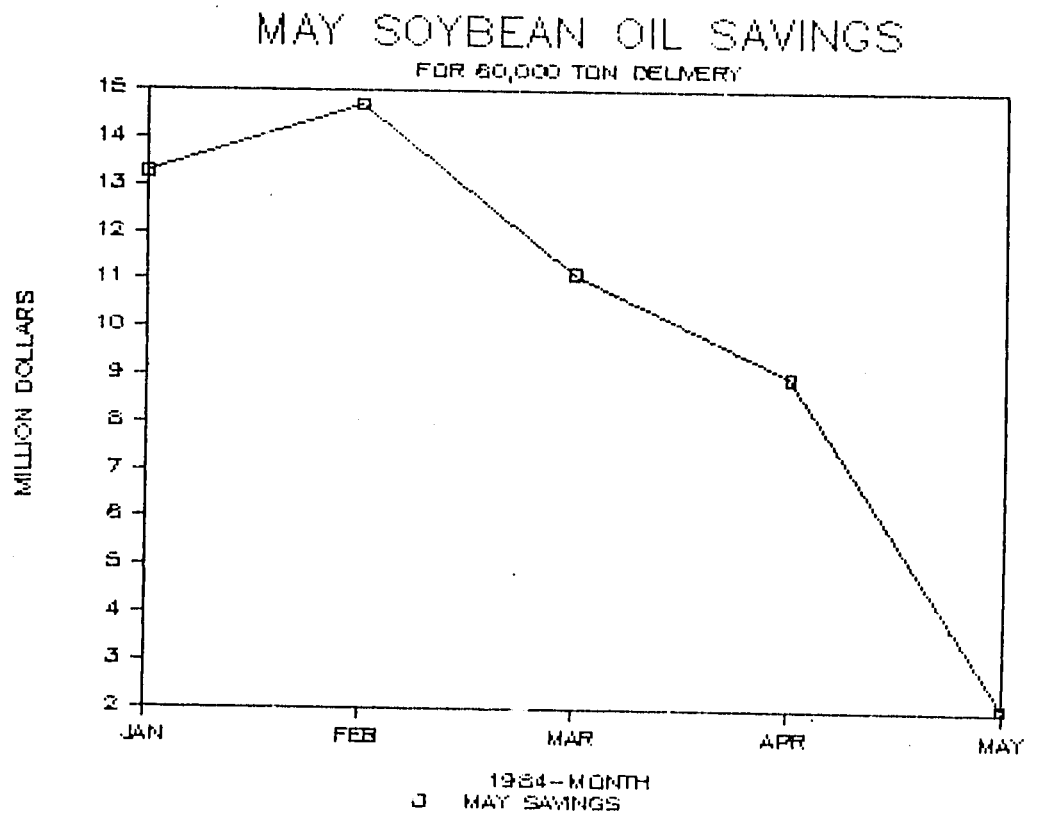


FIGURE 5-8



time and then tends to narrow progressively toward the next harvest period, reflecting rising storage and interest costs. The wide harvest basis reflects the heavy farm selling as the farmers' needs for cash or lack of storage space dictate. If the basis, which also represents supply and demand, starts to vary from the norm or trend price, action can be taken to protect the buying program. The advantages to Pakistan would be assuring the supply of vegetable oil at a known differential relative to the price of futures. It further gives the flexibility of Pakistan pricing at an advantage if the market meets its buying program goal. This could be in cash or futures contracts.

The agreements suggested could apply equally to soybean oil and palm oil. It would be most efficient to have one company handling both oils as the two vegetable oils constitute a major portion of the total international trade.

Buffer Stocks

Buffer stock approaches to food security essentially formulate the problem as an inventory scheduling model. Regardless of how government buffer stock programs are formulated, seasonal or intra-year inventory adjustments throughout the marketing chain always present special price risk problems. Brokers, warehousemen, processors and distributors adjust their inventories with respect to sales requirements, or expectations, and the availability of new supplies from government stocks and the open market. Storage approaches to the inventory problem include the usual price risk when buying in one time period for later use, plus storage and interest costs during the carrying period. Financial approaches to inventory adjustments seek to minimize carrying charges by contracting to take delivery on the commodity at a future date for immediate processing and sale. The following sections assess the feasibility of storage and financial approaches to Pakistan's edible oils stock and trade management system.

The Storage Approach: Of the approximately 269,000 tons of edible oil storage space available nationwide to the GCP, about 201,000 tons are located at the Karachi port. Edible oil demand for 1983, excluding industrial oil, was about 874,000 tons, or about 73,000 tons per month. These storage availabilities and demand requirements mean the GCP can store about 2.75 months of oil requirements on a full storage utilization basis.

The storage capacity at Karachi is augmented by the amount of oil on ships in-transit from origin or waiting to discharge (Table C-2). Computing an average for the period July, 1980, to June, 1984, of month-end stocks at Karachi and on ships, plus an estimate of 75 percent effective use of the storage located at the processing plants results in an actual utilization of storage space of approximately 3.25 months.

There are no data available for oil stocks and flows in the distributive and retail markets, but with the controlled prices and frequency of purchases by the consumer, inventories are probably quite low.

Current stocks are adequate, but the in-transit time of rail cars, which currently move 25 percent of the imported oil, has a turn-around time of 8-14 days. When these turn-around times are coupled with normal delays, the current 3.25 months of storage capacity represents a very close supply line.

The demand for vegetable oils for 1987, outlined in Table 2-2 and based on the two scenarios, is in the range of 1.23 to 1.31 million tons. This is a minimum increase of 509,000 tons from 1983, equal to a demand of 102,500 tons per month versus a 1983 monthly demand of 72,000 tons. Assuming the utilized storage space of 3.25 months' supply, the GOP would require 333,125 tons of space without allowing for the additional time required for the increased logistical problems that would apply as quantities increase.

The potential of buffer stocks will be limited by the storage capacity and the present buying policies of the GCP for soybean oil and palm oil. There is also the problem of a loss of oil quality, and since the oil storage turnover rates have been high, generally 15 to 45 days, there is little local experience with the longer term effects of storage on oil quality. Discussions with the GCP and private trade indicate that there have been instances when the free fatty acid rose to 4.5 percent during storage. This should not happen to properly stored, degummed soybean oil. There has been the normal loss of weight and quality which the GCP monitors. There are several conditions that can effect the oil quality including.

a. Accumulation of sludge at the bottom of the storage tank.

b. Excess moisture level in the oil at the time of delivery to the storage tanks.

c. A combination of high humidity, high daytime temperatures and relatively low night temperatures will create moisture in the tank from sweating.

d. Moisture can also be introduced if the oil is pumped into the tanks by oil spraying through the air in the tank.

The use of modern techniques to prevent this problem should be implemented for any new space and for up-dating the present storage facilities.

The projected additional storage requirements during the next decade and the government's already inadequate investment schedule for the GCP strongly imply that most of the additional future storage capacity will have to be built by the private sector. Since the buffer storage capacity is very limited and there is insufficient technology to physically maintain edible oil stocks over an extended time, the storage approach to edible oils stock and trade management is extremely limited.

The Financial Approach: Storage problems could be minimized by maintaining edible oil buffer stocks through hedging strategies in the cash and futures markets. The palm oil market is still in a transition period following major trading malpractices in the Kuala Lumper market in early 1984; however, the soybean oil futures market enjoys the world-wide trust of traders. Soybean oil contracts could be purchased or sold at the exchange for a margin money requirement of about 10 percent of the full value of the contract.

Edible oil importers can use a combination of futures and cash transactions to minimize both carrying charges and price risks. When soybean oil is bought on the cash market, payment is not made until the vessel arrives in Karachi. The price risk associated with that cash transaction can be minimized by a combination of contract buys and sells, depending on the price of the current futures option relative to the expected cash price in the month that oil must enter the shipping pipeline to reach Karachi on schedule.

The expected futures cash price is difficult to predict, as demonstrated with soybean oil in Annex E; however, seasonal trends are an important first step toward choosing a subjective expected price. Current developments in the world edible oil market will provide the major qualitative justification for adjusting the trend price. Finally, an importer will be guided by demand conditions in the domestic market. Low expected domestic selling prices, relative to the expected future cash import price, will have a higher profit risk for the importer than the converse price relationship.

Table 5-5 summarizes basic import hedging strategies for three common price situations. When, at the future time that shipment to Pakistan must begin, the expected cash price is higher than the current future option (Situation 1), an importer would buy a futures contract (take a *long position*) now and sell it, as the future shipment date is approached, for a higher price, near the cash price. The sale price of the contract would then be applied to a cash purchase near the scheduled shipment date. The difference between the two futures transaction prices would be the hedging benefit. Any loss due to an advance in the cash edible oil price would be largely offset by a comparable gain in price of the futures contracts previously traded.

TABLE 5-5. A SUMMARY OF BASIC IMPORT HEDGING STRATEGIES

	Situation Future Expected Cash Price is:	Strategies
1.	Higher than current futures option.	Buy futures contract now and sell before shipping date.(a)
2.	Lower than current futures option.	Sell futures contract now and buy before shipping date. (a)
4.	Same as current futures option.	Indifferent between cash and futures markets.

Notes: (a) Shipping date is the last date shipment can be expected to leave the exporting country and arrive in Karachi on schedule.

When the expected cash shipping is lower than the current futures option (Situation 2), an importer would sell a futures contract (take a *short position*) now and, as the future shipment date is approached, buy it for a lower price, near the cash price. The sale price of the contract would then be applied to a cash purchase near the scheduled shipment date and the difference between the two futures transaction prices would again be the hedging benefit. Any loss suffered on the cash oil purchase would largely be offset by a comparable gain in the futures contracts closed out.

Finally, if the expected cash price at shipping time is equal to the current futures option (Situation 3), an importer would be indifferent between taking a futures position now and waiting to make a cash purchase later. In this situation, there is no expected hedging benefit, but there is also no expected price risk.

If Pakistan's edible oil importers adopted these basic strategies, their purchasing programs would be diversified such that risks would be hedged and carrying costs would be minimized. These buying programs would serve as a national buffer stock, yet avoid many of the costs of the physical storage approach.

CHAPTER VI

EDIBLE OIL POLICY OPTIONS

This chapter briefly identifies several GOP economic objectives which are directly affected by current policies in the edible oil sector. These policies are then examined, followed by a description of a policy framework for developing a national edible oils strategy. Finally, a brief assessment is made of the role of an edible oils commodity exchange in a national strategy.

National Economic Objectives

Current edible oil sector policies should work towards fulfilling the national economic objectives identified in the GOP's Sixth Five-Year Plan. These objectives include:

- Mobilization of private sector resources and economic deregulation.
- Srengthening the agriculture and rural sectors by raising agricultural production and yields and improving farmer income.
- Minimization of balance of payments problems and foreign exchange stringency.
- Increased national food security.

Failure to achieve the first objective, in turn, would have serious negative effects on the other objectives. Significantly enhanced private sector investment and the application of increased private sector resources to economic activities in Pakistan are indispensable to the success of the GOP's Sixth Five-Year Plan. Increased vulnerability in any basic food commodity brought about by ineffectual or excessively limited participation of the private sector would raise serious political and social issues as well as lead to unhappy economic consequences. Increasingly severe foreign exchange shortages carry negative implications for improvment and growth as well as for the overall level of critically needed imports. Thus, it is important to examine how current edible oil policy bears on the above objectives.

Impact of Current GOP Edible Oil Policies

Government policies discourage production of oilseeds by placing Pakistan's farmers at a disadvantage vis-a-vis foreign suppliers. When world market prices are high, the public sector imports oil at high prices and sells at lower prices to processors and consumers. Domestic oilseed producers thus have no incentive to respond to the market. When world market prices are low, incipient domestic production capacity is equally frustrated by lower priced imported oil.

Private sector investment is inhibited by the public sector: ownership and operation of processing facilities; domination of the purchase and distribution of cottonseed oil; and dominance in oil importation. The public sector furthermore discourages private sector participation by controlling the: establishment and production levels of private sector processing plants; the amount of oil refined in the retail market; and retail prices.

Current edible oil policies assure large and growing outlays of foreign exchange, projected at $2.9 billion by 1994, to meet the demand for edible oil. Since the GOP is the principal importer, these are outlays of publicly owned foreign exchange. Price controls and subsidies encourage consumption. Increased edible oil imports create a drain on the treasury in both foreign exchange and local currency. In 1983/84 edible oil imports accounted for 4.6 percent of total government expenditures and will increase to 9.15 percent by 1994 if current trends continue.

Findings of the recent USDA *Edible Oilseed Industry Study* and this analysis conclude that current edible oil policies and practices run counter to national economic objectives. Investment in production and processing capacity

is not keeping pace with projected requirements. Even more alarming, current edible oil policies hasten the day when shortages and rationing will occur as domestic production is stagnating and imports are growing to meet rapidly rising demand.

Obstacles to a More Viable Edible Oils Market

In the existing environment, it is not surprising that the cultivation of oilseeds has not increased and the private sector is not investing in this critical industry. The major obstacles to establishing a viable and growing domestic edible oil industry include:

GCP Control of Cottonseed Oil: The GCP's monopoly control over cottonseed oil has contributed to the economic decline of the cotton sector and decreased marketing and production efficiencies throughout the edible oils sector. Because cottonseed crushers are forced to sell oil to one buyer (the GCP) the lack of market competition for their product has contributed to declining oil extraction rates. Since most of the domestic edible oil supply is cottonseed oil, the absence of an active market of cottonseed oil traders has raised marketing costs and reduced price competition from the farmgate to the wholesale sector.

Private Sector Oil Sanctions: The Ministry of Industry's edible refinery sanctioning requirement has caused production inefficiencies in the private sector. The sanctioning process often delays refinery construction and operation, and thereby adds to production costs. Too many sanctions are issued for small production capacities, instead of encouraging plant capacities of more than 30,000 tons per year, where unit operating costs are less than one-half the level in 9,000 ton plants. This process also reduces market competition (raises marketing costs) by making private sector refineries dependent on the GCP for imported oil, rather than allowing them to take bids from an imported oil market that pits all domestic refinery buyers against all imported oil sellers.

Retail Vegetable Ghee Price Controls: Price controls have aggrevated the edible oil import problem because consumers can spend larger shares of additional income on relatively cheaper oil. Since only vegetable ghee prices are controlled, liquid cooking oil prices have not remained sufficiently low to lure consumers away from ghee consumption. Pakistan's ghee price controls have also caused its edible oil prices to be substantially below border prices which is stimulating smuggling to neighboring countries. Finally, vegetable ghee price controls have reduced the market's ability to effectively respond to changes in domestic and import supply and demand conditions.

Discriminatory Taxes for Edible Oils Traders: The current practive of levying a 70 percent tax on all edible oil imported for commercial trading purposes has effectively driven traders out of the wholesale edible oil maket. If edible oil traders were allowed to import oil under the same tax levy as "industrial" oil to be used in ghee and cooking oil production, a strong trading community would evolve to create a more efficient means of edible oil price discovery. A wholesale edible oil market supported by a large number of traders would help farmers receive the highest competitive prices for oilseeds while simultaneously reducing domestic marketing margins and providing vegetable ghee and liquid cooking oil at the lowest competitive price consistent with GOP import policies.

Inconsistent Import Policy. Edible oil imports have also continued to increase rapidly because there is not a mechanism to prevent imports from being landed at prices well below domestic edible oil prices. During periodic declines in import prices, private sector edible oil imports will continue to grow even more rapidly unless the GOP institutes a comprehensive import licensing system that levies an equalizing tax on all imports priced below the domestic oil floor price. The difference between the domestic oil floor price and the lower import price should be viewed as a licensing fee intended to rationalize the long term linkage between domestic and international prices. This new import pricing policy would also simplify the monitoring of public and/or private sector imports by concerned GOP agencies.

Inconsistent Oilseed Support Prices: The domestic oilseed support price structure has not been coordinated with a long term approach to import price policy. When domestic oilseed prices are lower than imported oil prices, farmers are denied an important financial incentive to produce oilseeds as a substitute for imported oil.

Towards a National Edible Oils Strategy

Although Pakistan's edible oil problem has been thoroughly studied by the GOP and donor agencies, the government has yet to formulate a comprehensive edible oils strategy. If an edible oils strategy is to be effective, it must recognize the interdependence between policy reforms through all parts of the industry.

The Import Market

Access to Imported Oil: The import oil market should be streamlined to facilitate easy access by any edible oil refinery or trader. The GOP should not channel all edible oil imports through a government agency such as the GCP and/or the TCP. The proper role of the government in controlling edible oil imports is to insure that foreign exchange transactions are executed efficiently and the domestic oil market is protected from periodic low import prices.

import Trade Policy: The GOP should insure that all edible oil imports do not enter the domestic market at a price beow the long-term average import price. If the average import price trend line procedure discussed later in this chapter and in Annex E were adopted, all imported oil would arrive at up-country refineries at a cost equal to the import floor price, plus a 5-6 percent landing cost and internal transportation costs of between Rs 200 (train) and Rs 360 (truck) per ton. This up-country price of imported oil would be the effective domestic opportunity oil price, which would also determine the oil related values of domestic oilseeds.

The Domestic Market

The domestic edible oils market should be reformed to reflect the oil cost structure described in detail in the next section. However, wholesale pricing reforms alone will not reduce the imported oil cost burden unless the role of the GCP is greatly reduced or abolished.

Oilseed Production: The GOP should place more emphasis on market and pricing reforms to stimulate domestic oilseed production. The GCP should not be involved in oilseed development programs, and the proposed new Edible Oilseed Development Corporation (EODC) should be restricted to a very narrow, intensive extension program. The current oilseed price support system should be eliminated because the GOP cannot guarantee that it will promptly purchase every farmer's non-traditional oilseed crop. Instead, the government should adopt an import pricing mechanism to determine and maintain consistent oilseed prices. Oilseed processors should be allowed to sell any oil to any legitimate buyer. The GCP should be allowed to compete openly with edible oil refiners and commercial traders for both cottonseed oil and non-traditional purchases.

Edible Oils Processing: The current practice of issuing sanctions to private edible oil mills should be eliminated. The private sector should be encouraged to build larger plants and use more cost effective batch processing technologies. The GCP should be prohibited from building additional plants and storage capacity.

Pricing Policy: An aggressive and well managed import pricing policy, linked to long term trends in the world market can be a convenient and effective tool for rationalizing the domestic wholesale edible oil market back to the farmgate. On the retail side, the current policy of controlling retail vegetable ghee prices should be relaxed. The price decontrol scenario discussed in Annex B illustrates the consequences of allowing ghee prices to rise at an annual rate of 10 percent, rather than the past rate of 6.6 percent.

Recommended Policy Framework

The following recommendations to establish a credible national edible oil strategy builds upon those contained in the USDA report entitled *Pakistan's Edible Oilseed* Industry and allows for changing conditions in the international edible oil market. These proposed actions are inter-related and mutually reinforcing. Their piecemeal implementation, however, would reduce the likelihood of success in re-vitalizing the domestic edible oil industry.

Denationalize the GCP

The GCP continues to advocate a shift toward denationalization. Rapid denationalization of the GCP would make a major contribution toward easing the edible oil import problem and release huge sums of treasury funds now required to support its operations.

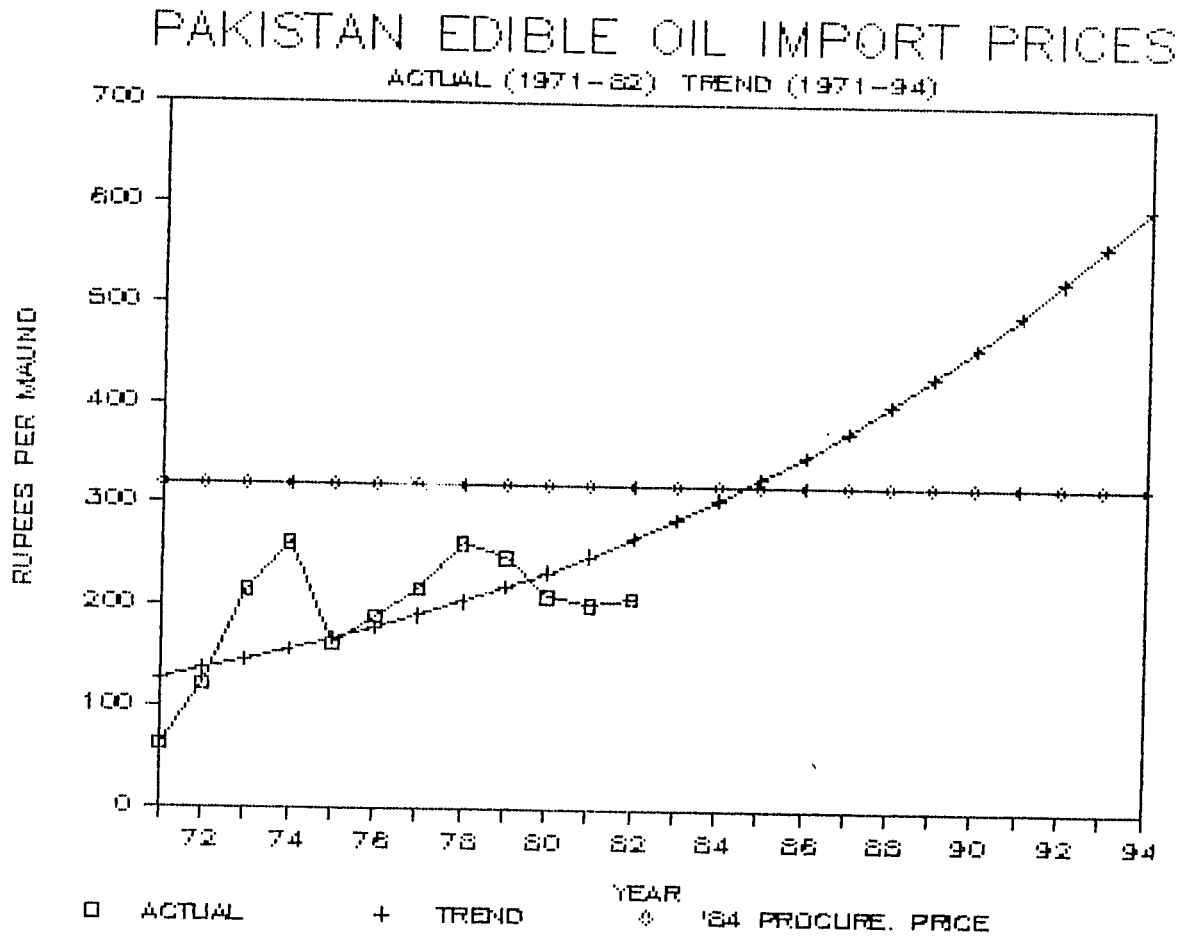
Most GCP plants have not been properly maintained since nationalization and would not attract strong bidding by private buyers. Two GCP ghee mills have been closed, but they have not been dis-invested because questions about the legality of the original nationalization order have not been settled by the courts.

Whatever problems and obstacles are associated with denationalization, the economic and political costs of a stagnating domestic edible oil industry, continued and growing subsidies for GCP operations, increased imports of edible oil, and reduced food security eventually resulting in scarcity and/or rationing of this important foodstuff are incomparably greater.

Rationalize Imported Edible Oil Prices

The regulation of edible oil imports has failed to protect domestic oilseed producers from periodic declines in import prices. Figure 6-1 summarizes the relationship between past average oil import prices and a trend line estimated in Annex E. If the GCP implemented a policy of establishing a series of intermediate term (3-5 years) edible oil import price floors, based on a trend of past import prices, the oil import situation could be improved in two vital ways.

FIGURE 6-1



First, when import prices fall below the government's import floor price, an import tariff can be collected on the difference between the two. This action would tend to weaken import demand during periods of abnormally low prices. The import price floor would also help the GOP rationalize processing cost disparities between RBD plam oil and soybean oil and reduce the cost advantage of palm oil. Ghee mills save about two rupees per kilogram of RBD palm oil used because palm oil requires no additional hydrogenation or refining. When import prices fall below the import price floor, this import pricing system would reduce the tendency of refiners to use more, relatively unhealthy palm oil.

Finally, the import price floor offers a more efficient means of establishing a domestic oil floor price that is in concert with long term border prices. If the trend line procedure for Figure 6-1 is adopted, all edible oil producers and processors will have greater certainty about the profitability of oilseed production and processing and edible oil refining because they will be able to predict future domestic oil prices more accurately and enter into forward contracts with less oil price risk. It should be noted that this import floor price procedure would cause imported oil to cost the refinery more than the domestic oil price because import landing and local transportation costs would still have to be incurred. The GOP estimates the current landing cost to be about 13 percent of the import price ($600-750 per ton).

Restore Open Competition in Oilseed Markets

Oilseed production and improved oilseed marketing will not occur until oilseed crushers are allowed to sell oil to any buyer, not exclusively to the GOP. If all edible oil refiners and traders are permitted to compete with the GOP, oilseed crushers will discover new financial incentives to improve oilseed extraction rates.

If the GOP allows cottonseed oil to be traded in open competition, edible oil traders will also become more competitive for non-traditional oils. Increased competition in wholesale edible oil markets will be linked to the import oil floor price. In this situation, open competition for oils would cause the market to discover oilseed prices which more nearly reflect the opportunity import oil price. Table 6-1 summarizes the estimated minimum market prices of the major edible oilseeds based on import floor prices forecasted in Annex E, Table E-6.

It should be stressed that the estimated oilseed prices in Table 6-1 are minimum values because the table's assumptions are conservative. The 10 percent seed waste or loss rate is higher than would be expected in a highly competitive market. The oil extraction rates could also be expected to increase with renewed competition. Oilseed traders would argue that most oilseed meal prices would probably settle at levels well above Rs 2 per kilogram. The oilseed crushing and extraction cost is also higher than would be expected if the crushing volume is increased significantly.

It would also be noted that the 1984 sunflower and safflower seed price estimates in Table 6-1 agree with current support prices if the imported oil floor price is raised to the current domestic oil procurement price of Rs 320 per maund. However, the soybean support price is 50 percent higher than the competitive price predicted if the import floor price were Rs 307 per maund, and 44 percent higher if the current domestic oil procurement price is assumed.

Table 6-1 presents some important insights about the structural relationships between the imported oil floor price, oilseed prices, and retail vegetable ghee prices. If the forecasted imported oil floor prices were implemented for the 1984-1994 period, the import floor price (or domestic oil opportunity price) would increase at a compound annual rate of about 6.7 percent (Table E-7). The retail vegetable ghee price implied by the alternative import oil floor prices would increase at about 4.8 percent per annum. Oilseed price increases would vary directly with their oil extraction rates. Sunflower seed prices would grow at an annual rate of about 6.3 percent, almost the same rate as the imported oil floor price. In contrast to sunflower seed, cottonseed prices would grow by only 3.9 percent per annum because of its low oil extraction rate.

TABLE 6-1. ESTIMATED MINIMUM MARKET OILSEED PRICES FOR ALTERNATIVE IMPORTED OIL FLOOR PRICES

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
	RUPEES PER MAUND										
Imported Oil Floor Price (a)	307 (b)	328	351	375	401	429	459	492	526	562	602
Cottonseed	75	78	80	83	86	90	93	97	101	106	110
Sunflower seed	135	143	152	161	171	182	193	206	219	232	248
Soybean	87	90	94	98	103	107	113	118	124	130	137
Safflower Seed	112	118	125	131	139	146	155	164	174	184	195
	RUPEES PER TON OF SEED										
--Oil Value--(c)											
Cottonseed	987	1055	1128	1206	1289	1379	1476	1582	1691	1807	1935
Sunflower Seed	3126	3339	3574	3818	4083	4368	4673	5009	5355	5722	6129
Soybean	1398	1494	1599	1708	1826	1954	2091	2241	2396	2560	2742
Safflower Seed	2303	2461	2633	2813	3008	3218	3443	3691	3946	4216	4516
--Meal Value--(d)											
Cottonseed	1560	1560	1560	1560	1560	1560	1560	1560	1560	1560	1560
Sunflower Seed	1040	1040	1040	1040	1040	1040	1040	1040	1040	1040	1040
Soybean	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460	1460
Safflower Seed	1240	1240	1240	1240	1240	1240	1240	1240	1240	1240	1240
-Extraction Cost-(e)	536	536	536	536	536	536	536	536	536	536	536
--Seed Value-- (f)											
Cottonseed	2011	2079	2153	2230	2313	2403	2500	2606	2715	1831	2960
Sunflower Seed	3630	3844	4078	4322	4587	4872	5177	5513	5859	6226	6633
Soybean	2322	2418	2523	2632	2751	2878	3015	3165	3320	3484	3666
Safflower Seed	3007	3165	3337	3517	3712	3922	4148	4395	4650	4920	5220
	RUPEES PER KG OF GHEE										
Implied Retail Ghee Price (g)	13.15	13.71	14.33	14.97	15.67	16.42	17.22	18.11	19.02	19.98	21.06

Notes:
(a) Prices are the 1971-82 average import price trend (Annex E, Table E-6).
(b) 1984 support prices per maund: Sunflower, Rs 140; Soybean, 131; and Safflower, 117.
(c) Assumed oil extraction rates: Cotton, .12; Sunflower, .38; Soybean, .17; Safflower, .28.
(d) Assumed salvage value of all oilseed meals is Rs 2 per kg.
(e) Assumed cost of crushing/solvent extraction for all seeds is Rs 20 per maund.
(f) Assumed waste/loss rate for all seed is .1.
(g) A standard margin of Rs 4.93 per kg. is added to the floor price.

Decontrol Retail Prices

Edible oil resources will incur lower marketing and production costs if retail prices are completely deregulated. Although retail prices would initially rise faster than the past trend of 6.6 percent per annum, increased reliance on the market forces to discover prices will stimulate competition among traders, processors, and distributors. Production and marketing firms will expand operations and lower their unit costs.

It is not possible to accurately predict future price levels under a price decontrol policy, but it is unlikely that retail prices would rise at a long term rate of more than 10 percent per annum (the price decontrol scenario of Annex B). The calculations in Table 6-2 estimate that if a price decontrol policy were followed throughout this 10 year period, the GOP could save up to US$2.6 billion in foreign exchange costs through reduced edible oil imports.

Role of an Edible Oils Commodity Exchange in Policy Reforms

The above recommended policy framework does not consider the role of trading in the edible oils industry. This study and the USDA Oilseed Industry Study describe numerous examples of the poor market performance because government policies have restricted or abolished the role of commercial traders. If the national edible oils strategy is to be implemented successfully, it will require extensive GOP operations in establishing new or revitalized trading institutions.

Benefits of an Exchange

An edible oils commodity exchange is a crucial ingredient in any effort to improve market efficiency. If an exchange were established, it would improve the price discovery mechanism and simultaneously reduce farmers' price risk and marketing margins. Producers and processors have planning horizons that span crop seasons and other cyclical supply and demand factors. Current decisions about future production and marketing levels require some estimate of future product and input prices.

Futures prices are an important means of estimating how traders measure future price risks. Futures prices cannot accurately predict future cash prices, but they allow the market to make price adjustments in a more orderly fashion. When firms use futures prices to discover guaranteed prices at some future date, they are reducing their price risks and making an important first approximation in discovering future cash prices.

An edible oil commodity exchange in Pakistan would reduce the present advantages import suppliers enjoy by dealing only with the GCP. The GCP's import buying operations would benefit by improved local price quotations reflecting a broader set of competitors agreeing on freight rates and oil prices. The exchange would also help edible oilseed crushers and refiners use forward pricing strategies to hedge future processing requirements to reduce price risk. Farmers would benefit from more competitors seeking to buy their oilseeds at prices that are in concert with rising import prices and domestic demand requirements.

Prerequisites for Trading Incentives

There are no incentives for development of a new commodity exchange until the GOP adopts the policy changes recommended in the previous section. The major changes are listed below in the following order of priority.

* The relinquishment of the GCP's monopoly control over the cottonseed oil market.
* The discontinuance of sanctions for private sector edible oil mills.
* The establishment and enforcement of a rational import price floor.
* The removal of all retail edible oil price controls.

An Implementation Scenario

The development of an edible oils commodity exchange involves at least four distinct phases.

Phase I: A market feasibility study should be conducted to determine the nature of expected participation and existing policy barriers.

Phase II: If the market feasibility study is favorable, the necessary infrastructure for the exchange should be

formed as soon as possible. Exchange operating procedures would be established and memberships would be registered. Seminars could be conducted to demonstrate exchange operating procedures and futures trading techniques.

Phase III: The exchange would initially operate only in the domestic edible oil market. As the local trading community gains experience in the exchange, operating rules could be changed to improve trading efficiency and regulate deceptive trading practices.

Phase IV: After the exchange gains the edible oil industry's confidence that it can provide superior trading services, trading operations would be expanded to include imported oil in both the Karachi and foreign commodity exchanges.

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ANNEX A

EDIBLE VEGETABLE OIL PRODUCTION AND USAGE

Assessment of Pakistan's edible oils sector performance is diff cult because production and utilization statistics from alternate sources are often inconsistent. Estimates produced in this annex are the result of extrapolations from various government documents after consultations with edible oils specialists throughout the edible oil sector.

Production

Despite ambitious government plans to stimulate edible oil production during the last decade, traditional oilseed crops have stagnated. Cotton acreage has fluctuated between 1.8 and 2.3 million hectares, but the oil extraction rate has steadily declined (Table A-1). Various estimates of cottonseed extraction rates above 14 percent a decade ago and above 12 percent during recent years have been found to be overly optimistic. Mustard and rapeseed acreage is declining, although rape-mustard oil prices have not been controlled (Table A-2). Rape-mustard oils are mainly extracted by village kholus.

The statistical base for non-traditional oilseed production (sunflower, soybean, safflower, and groundnut) is too small to yield reliable national oil production estimates. It is conceded that up to 5,000 metric tons of non-traditional oils may be produced annually, but acreages and seed yields are extremely variable within local production areas and do not indicate sustained growth.

Imports

Edible oil imports have increased from about one-third of the requirements a decade ago to about four-fifths of current requirements. Prior to 1975, soybean and palm oil imports were erratic (Table A-3). During 1975-1980, approximately equal amounts of soybean and palm oils were imported. During 1981 and 1982, relatively low palm oil prices and liberal importation by private edible oil firms resulted in almost twice as much palm oil imports relative to soybean oil. During 1983, a sharp price reversal caused soybean oil imports to exceed palm oil imports. Abnormally high import prices in 1983 also forced private refiners to buy imported oil from the GCP at a subsidized price, rather than pay higher prices in world market.

Consumption

Edible oil consumption increased by about 180 percent during the past decade. Since 1973, industrial and cooking oil consumption have remained steady while vegetable ghee consumption has grown by about 240 percent (Table A-4). Cooking oil is defined in this study as mustard and rapeseed oils or refined vegetable oils other than palm oil.

TABLE A-1. PAKISTAN'S COTTONSEED PRODUCTION AND USE
1000 MT

Year	Area (1000 Ha)	Production		Use					
		Lint	Seed (a)	Seed	Waste	Crush	Extraction Rate	Oil (b)	Cake (c)
1971	1958	707	1354	37	141	1175	.1345	158	1017
1972	2010	702	1344	34	140	1170	.1315	154	1016
1973	1845	659	1262	38	132	1092	.1285	140	952
1974	2031	634	1214	34	127	1053	.1206	127	926
1975	1852	514	984	35	99	851	.1225	104	746
1976	1865	435	833	34	84	715	.1215	87	628
1977	1843	575	1101	35	115	951	.1205	115	836
1978	1891	473	906	38	92	776	.1195	93	683
1979	2081	728	1394	37	144	1213	.1185	144	1069
1980	2108	715	1369	37	137	1195	.1175	140	1055
1281	2214	748	1432	39	149	1244	.1165	145	1099
1982	2262	824	1578	39	158	1381	.1155	159	1221
1983	2274	497	952	39	102	811	.1145	93	718

Notes: (a) Seed production equals 1.9146 times lint production.
(b) Once refined oil produced at solvent and expeller mills 1971-77 and mostly expeller mills thereafter.
(c) Cake contains linters and hulls.

Source: Agricultural Statistics of Pakistan, various issues.

TABLE A-2. PAKISTAN'S RAPE/MUSTARD SEED PRODUCTION AND USE
(1000 MT)

Year	Area (1000 Ha)	Production	Use			
			Waste	Crush	Oil (a)	Cake
1971	510	269	17	252	76	176
1972	562	296	15	281	84	197
1973	534	282	14	268	80	188
1974	536	288	14	274	82	192
1975	452	244	12	232	70	162
1976	470	267	17	250	75	175
1977	519	292	15	277	83	194
1978	412	237	12	225	68	158
1979	433	248	17	231	69	162
1980	409	247	12	235	71	165
1981	417	250	13	237	71	166
1982	385	246	13	233	70	163
1983	400	242	13	229	69	160

Notes: (a) A 30 percent extraction rate (mainly kholus) is assumed.

Source: Agricultural Statistics of Pakistan, various issues.

TABLE A-3. PAKISTAN'S EDIBLE OIL IMPORTS
(1000 MT)

Year	Soybean Oil	Palm Oil	Cottonseed Oil	Rape/Mustard Oil	Total Imports
1971	45	1			46
1972	62	3			65
1973	166	1	7	1	175
1974	63	131		3	197
1975	117	150		1	268
1976	149	136			285
1977	172	128	10		310
1978	260	132			392
1979	213	203			416
1980	233	234			467
1981	223	401			624
1982	235	422			657
1983	385	336			721

Sources: USDA/FAS, GCP, Economic Survey of Pakistan, various issues, and Aide Memoires on Pakistan's Requirements of Edible Oils/Fats, various issues.

TABLE A-4. PAKISTAN'S EDIBLE VEGETABLE OIL SUPPLY AND USE
(1000 MT)

	Supply				Use				
Year	Begin Stock	Local Production	Imports	Supply	Industrial	Cooking Oil	V. Ghee Oil Used	Ghee Produced	End Stock
1971	40	234	46	320	34	72	178	162	36
1972	36	238	65	339	32	79	205	187	23
1973	23	221	175	419	55	84	249	225	31
1974	31	209	197	437	32	65	291	272	49
1975	49	174	268	491	35	70	303	277	83
1976	83	162	285	529	32	82	356	329	59
1977	59	198	310	567	34	80	393	364	60
1978	60	160	392	612	36	66	465	439	45
1979	45	213	416	674	39	70	510	473	55
1980	55	211	467	733	39	73	544	527	77
1981	77	216	624	917	41	75	695	699	106
1982	106	229	657	993	45	83	765	749	100
1983	100	162	721	982	53	83	780	759	66

Sources: USDA/FAS, GCP, Economic Survey of Pakistan, various issues, and Aide Memoires on Pakistan's Requirements of Edible Oils/Fats, various issues.

ANNEX B

EDIBLE OIL DEMAND AND SUPPLY FORECASTS

Past studies of Pakistan's edible oils sector have generally offered mildly optimistic appraisals of future production. That most of the predicted future production was not achieved is a testament to the profound market disincentives that have dominated the past decade.

Past forecasts of future edible oils consumption trends have predicted surprisingly large consumption increases. Again, history has proven the previous analysts wrong, but in the case of consumption, their estimates proved to be significantly smaller than the actual trend.

These observations are a sober warning about the danger of forecasting; yet this study required benchmark estimates of future edible oil statistics to assess future import trading volumes and processing and storage requirements. Data from Table B-1 were used to estimate vegetable ghee and cooking oil demand forecasts and domestic edible oils production forecasts. Differences between alternative demand and production forecasts were defined as alternative estimates of future import requirements.

Demand Forecasts

A demand forecast model was specified with the following general form:

$$LQ = a + b^{*}LP + c^{*}LPS + d^{*}LI + e^{*}T + u \qquad [B\text{-}1]$$

where

- LQ = the natural logarithm of consumption (1,000 tons)
- LP = the natural logarithm of the retail price of the good in question, in current rupees (rupees per kilogram)
- LPS = the natural logarithm of the retail price of a substitute good, in current rupees (rupees per kilogram)
- LI = the natural logarithm of income per capita, in current rupees (GNP per capita)
- T = an arithmetic trend index beginning with "i" for the first year in a time series of observed data
- a–e = estimated partial regression coefficients
- u = the variance of observed values of the dependent variable (LQ) about an estimated regression path.

Parameters b, c, and d are direct estimates of constant elasticities. The trend parameter, e, is arithmetic, yieiding and estimate of the compound annual growth rate of the dependent variable, net of all other variation explained by the model.

Vegetable Ghee Demand. The results of the vegetable ghee demand forecast model are summarized in Table B-2. Mustard oil is used as a proxy for cooking oil, a close substitute or cross-price effect on ghee. The signs of the coefficients are as expected, although the mustard oil price (LCP) is statistically insignificant. The model cannot be strictly interpreted as a consumer demand model since it is not constrained for homogeneity, Engle aggregation, and Slutsky symmetry conditions; however, the price elasticity (–.54) and the income elasticity (1.08) are remarkably close to recent full system estimates for Sri Lanka by Chieruzzi, Morgan, and Yetley.

Cooking Oil Demand. The cooking oil demand forecast model results are in Table B-3. Income was deleted from the model because of severe multicollinearity problems. Again, the price parameters (the substitute or cross-price is ghee) have the correct signs, although the proportion of variation explained by the model (51 percent) is much lower than the ghee model.

Edible Oil Demand Forecasts. The regression coefficients from Tables B-2 and B-3 were used to forecast annual demands through 1994, based on two market scenarios. A steady state forecast assumes that the trends of the past

(1971-1983) will continue throughout the forecast period. This assumption results in a ghee demand growth rate of 11.8 percent over the next decade (Table B-4).

An alternate scenario was constructed to demonstrate the effects of a price decontrol policy on ghee demand over the next decade. Instead of forecasting annual ghee price increases of 6.6 percent, as in the past, a 10 percent growth rate was assumed. The price decontrol scenario results in an annual growth rate of 9.9 percent and a forecast of about 450,000 tons less ghee in 1994 than if past policy trends continue. Under steady state assumptions, the cooking oil price will rise faster than the ghee price. In contrast, the price decontrol assumptions forecast ghee prices exceeding cooking oil prices in about 1991.

Steady state assumptions forecast cooking oil demand to decrease 2.8 percent per annum over the next decade if past trends in edible oil prices and income per capita continue (Table B-5). Cooking oil demand is forecast to decrease 2.1 percent per annum over the next decade if a price decontrol policy is followed.

Alternate forecasts of major edible oil demand are summarized in Table B-6. Total demand will increase about 11 percent per annum under steady state conditions, compared to a 9.2 percent growth rate in a price decontrol environment. It should be noted that these forecasts do not include industrial demand, which has varied from 30 to 50 thousand tons over the last decade, and inventories or carryover stocks.

TABLE B-1. PAKISTAN EDIBLE OIL MARKET DATA, 1971-1983

							Cottonseed		Mustard/Rapeseed			
		Vegetable Ghee			Cooking Oil		Yields		Yields		Imports	
Year	Trend	Qty. (a)	Price (b)	Income (c)	Qty. (a)	Price (b)	Seed (d)	Oil (d)	Seed (d)	Oil (d)	Qty. (a)	Price (a)
1971	1	162	5.10	778	72	3.70	691	81	527	148	46	1.63
1972	2	187	5.27	930	79	3.64	669	77	527	150	65	3.25
1973	3	225	6.60	1194	84	5.30	684	76	528	141	175	5.76
1974	4	272	8.44	1512	65	6.88	598	63	537	153	197	7.01
1975	5	277	9.64	1725	70	7.69	531	56	540	154	268	4.34
1976	6	329	9.67	1928	82	6.76	447	47	568	160	285	5.10
1977	7	364	9.66	2270	80	6.82	597	62	563	160	310	5.80
1978	8	439	9.80	2465	66	9.39	479	49	575	164	392	7.02
1979	9	473	10.77	2847	70	10.86	670	69	573	160	416	6.64
1980	10	527	10.85	3264	73	10.87	649	67	604	172	467	5.62
1981	11	699	10.91	3673	75	9.59	647	65	600	171	624	5.42
1982	12	749	10.92	4131	83	9.62	697	70	639	182	657	5.59
1983	13	759	12.50	4530	83	12.65	418	41	605	172	721	—

Notes: (a) Thousand metric tons. "Cooking oil" quantity is assumed to be mostly mustard/rapeseed oils.
(b) Average retail price, rupees per kilogram, at current prices. "Cooking oil" price is for mustard oil.
(c) GNP rupees per capita, at current prices.
(d) Kilograms of production per hectare.
(e) Average import price, rupees per kilogram, at current prices.

Sources: All oil and oilseed quantity data are from Annex A.
All price data are from the *Pakistan Economic Survey*, 1983-84.

TABLE B-2. VEGETABLE GHEE DEMAND FORECAST MODEL

NAME		MEAN	STD. DEV.
Ln (PRICE)	LP	2.190	.286
Ln (COPRICE)	LCP	2.011	.397
Ln (INCOME)	LI	7.650	.563
TREND	T	7.000	3.894
Ln (QNTY)	LQ	5.921	.518

DEPENDENT VARIABLE: LQ

VAR.	REGRESSION COEFFICIENT	STD. ERROR	T (DF=8)	PROB.	PARTIAL r^2
LP	−.544	.355	−1.533	.16374	.2271
LCP	1.6014E−03	.153	.010	.99191	1.36850E−05
LI	1.0 2	.497	2.180	.06090	.3726
T	.013	.055	.237	.81837	.0070
CONSTANT	−1.263				

STD. ERROR OF EST. = .051
R SQUARED = .9936
MULTIPLE R = .9968

ANALYSIS OF VARIANCE TABLE

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F RATIO	PROB.
REGRESSION	3.199	4	.800	310.822	8.300E−09
RESIDUAL	.021	8	2.5733E−03		
TOTAL	3.220	12			

	OBSERVED	CALCULATED	RESIDUAL	STANDARDIZED RESIDUALS −2.0 0 2.0
1	5.088	5.071	.016	
2	5.231	5.259	.028	
3	5.416	5.421	−4.950E−03	
4	5.606	5.556	.050	
5	5.624	5.640	−.016	
6	5.796	5.771	.025	
7	5.897	5.962	−.065	
8	6.084	6.057	.028	
9	8.159	6.174	−.015	
10	6.267	6.331	−.064	
11	6.550	6.469	.081	
12	6.619	6.609	.010	
13	6.632	6.648	−.016	

DURBIN-WATSON TEST = 2.8593

TABLE B-3. COOKING OIL DEMAND FORECAST MODEL

NAME		MEAN	STD. DEV.
Ln (PRICE)	LP	2.011	.397
Ln (GPRICE)	LGP	2.190	.286
TREND	T	7.000	3.894
Ln (QNTY)	LQ	4.321	.090

DEPENDENT VARIABLE: LQ

VAR.	REGRESSION COEFFICIENT	STD. ERROR	T(DF=9)	PROB.	PARTIAL r^2
LP	−.529	.216	−2.447	.03693	.3995
LCP	.261	.276	.947	.36852	.0906
T	.036	.014	2.664	.02586	.4409
CONSTANT	4.558				

STD. ERROR OF EST. = .073
R SQUARED = .5061
MULTIPLE R = .7114

ANALYSIS OF VARIANCE TABLE

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F Rat 10	PROB.
REGRESSION	.049	3	.016	3.074	.0833
RESIDUAL	.048	9	5.3119E−03		
TOTAL	.097	12			

	OBSERVED	CALCULATED	RESIDUAL	STANDARDIZED RESIDUALS −2.0 0 2.0
1	4.277	4.328	−.051	
2	4.369	4.381	−.012	
3	4.431	4.278	.153	
4	4.174	4.240	−.066	
5	4.248	4.253	−4.138E−03	
6	4.407	4.253	.049	
7	4.382	4.390	−7.530E−03	
8	4.190	4.261	.071	
9	4.248	4.245	3.7785E−03	
10	4.290	4.283	7.8629E−03	
11	4.317	4.387	.069	
12	4.419	4.422	−2.930E−03	
13	4.419	4.349	.070	

DURBIN-WATSON TEST = 2.3385

TABLE B-4. GHEE DEMAND FORECASTS, 1984-1994

.....STEADY STATE ASSUMPTIONS.....

PREDICTOR	'83 BASE	GROWTH RATE (%)	COEFFICIENT
			−1.2625668
GHEE PRICE	12.5	6.6	−.5442258
COOKING OIL PRICE	12.65	9.34	.0016014
PER CAPITA INCOME	4530	14.33	1.0824
TREND	13	11.8	.0130249

..... EXOGENEOUS VARIABLES.....

YEAR	FORECAST DEMAND	GPRICE	OPRICE	INCOME	TREND
1983	759	12.5	12.65	4530	13
1984	849	13	14	5179	14
1985	949	14	15	5921	14
1986	1062	15	17	6770	16
1987	1187	16	18	7740	17
1988	1327	17	20	8849	18
1989	1483	18	22	10117	19
1990	1657	20	24	11567	20
1991	1852	21	26	13225	21
1992	2070	22	28	15120	22
1993	2313	24	31	17286	23
1994	2584	25	34	19763	24

.....PRICE DECONTROL ASSUMPTIONS.....

PREDICTOR	'83 BASE	GROWTH RATE(%)	COEFFICIENT
			−1.2625668
GHEE PRICE	12.5	10	−.5442258
COOKING OIL PRICE	12.65	9.34	.0016014
PER CAPITA INCOME	4530	14.33	1.0824
TREND	13	9.9	.0130249

..... EXOGENEOUS VARIABLES.....

YEAR	FORECAST DEMAND	GPRICE	OPRICE	INCOME	TREND
1983	759	12.5	12.65	4530	13
1984	834	14	14	5179	14
1985	917	15	15	5921	15
1986	1008	17	17	6770	16
1987	1108	18	18	7740	17
1988	1217	20	20	8849	18
1989	1337	22	22	10117	19
1990	1469	24	24	11567	20
1991	1614	27	26	13225	21
1992	1773	29	28	15120	22
1993	1947	32	31	17286	23
1994	2139	36	34	19763	24

TABLE B-5. COOKING OIL DEMAND FORECASTS, 1984-1994

.....STEADY STATE ASSUMPTIONS.....

PREDICTOR	'83 BASE	GROWTH RATE(%)	COEFFICIENT
			4.557846
COOKING OIL PRICE	12.65	9.34	−.5290223
GHEE PRICE	12.5	10	.2611656
PER CAPITA INCOME	4530	14.33	0
TREND	13	−2.1	.0364339

..... EXOGENEOUS VARIABLES.....

YEAR	FORECAST DEMAND	OPRICE	GPRICE	INCOME	TREND
1983	83	12.65	12.5	4530	13
1984	81	14	13	5179	14
1985	78	15	14	5921	15
1986	76	17	15	6770	16
1987	74	18	16	7740	17
1988	72	20	17	8849	18
1989	70	22	18	10117	19
1990	68	24	20	11567	20
1991	66	26	21	13225	21
1992	64	28	22	14120	22
1993	63	31	24	17286	23
1994	61	34	25	19763	24

.....PRICE DECONTROL ASSUMPTION.....

PREDICTOR	'83 BASE	ANNUAL GROWTH RATE(%)	COEFFICIENT
			4.557846
COOKING OIL PRICE	12.65	9.34	−.5290223
GHEE PRICE	12.5	10	.2611656
PER CAPITA INCOME	4530	14.33	0
TREND	13	−2.1	.0364339

..... EXOGENEOUS VARIABLES.....

YEAR	FORECAST DEMAND	OFFICE	GPRICE	INCOME	TREND
1983	83	12.65	12.5	4530	13
1984	81	14	14	5179	14
1985	80	15	15	5921	15
1986	78	17	17	6770	16
1987	76	18	18	7740	17
1988	75	20	20	8849	18
1989	73	22	22	10117	19
1990	72	24	24	11567	20
1991	70	26	27	13225	21
1992	69	28	29	14120	22
1993	68	31	32	17286	23
1994	66	34	36	19763	24

TABLE B-6. TOTAL EDIBLE OIL DEMAND FORECAST, 1984–1994

.....STEADY STATE ASSUMPTIONS.....

YEAR	GHEE FORECAST DEMAND	GHEE OIL REQUIRED (a)	COOKING OIL (b)	TOTAL EDIBLE OIL DEMAND
1983	759	791	83	874
1984	849	884	81	965
1985	949	989	78	1067
1986	1062	1106	76	1182
1987	1187	1236	74	1310
1988	1327	1382	72	1454
1989	1483	1545	70	1615
1990	1657	1726	68	1794
1991	1852	1929	66	1995
1992	2070	2156	64	2220
1993	2313	2409	63	2472
1994	2584	2692	61	2753

.....PRICE DECONTROL ASSUMPTIONS.....

YEAR	GHEE FORECAST DEMAND	GHEE OIL REQUIRED (a)	COOKING OIL (b)	TOTAL EDIBLE OIL DEMAND
		1000 MT		
1983	759	791	83	874
1984	834	869	81	950
1985	917	955	80	1035
1986	1008	1050	78	1128
1987	1108	1154	76	1230
1988	1217	1268	75	1343
1989	1337	1393	73	1466
1990	1469	1530	72	1602
1991	1614	1681	70	1751
1992	1773	1847	69	1916
1993	1947	2028	68	2096
1994	2139	2228	66	2294

Notes: (a) A four percent processing loss is assumed, rather than the lower rate estimated in Table A-4 for 1981-1983 when large amounts of straight RBD palm oil were sold as ghee.

(b) Cooking oil is assumed to be mostly mustard and rapeseed oil. If future demand shifts toward liquid cooking oils, total demand forecasts are assumed to remain valid because the same processing loss would occur.

Production Forecasts

A conventional agricultural supply model might specify production as a function of product price and a set of supply shifters, such as input prices and proxies for technology. A preliminary edible oil supply (Model I) was specified as follows:

$$LQ = f + g^{*}LP + n^{*}LY + i^{*}T + w \qquad [B \cdot 2]$$

where

LQ = the natural logarithm of the quantity of edible oil produced (1,000 tons)
LP = the natural logarithm of the retail price of the product in current rupees (rupees per kilogram)
LY = the natural logarithm of the edible oil yield (kilograms of oil per hectare)
T = an arithmetic trend index beginning with "i" for the first year in a time series of observed data
f–i = estimated partial regression coefficients
w = the variance of observed values of the dependent variable (LQ) about an estimated regression path

Extracted crude oil was chosen as the dependent variable (LQ) to estimate supply response at the wholesale level, which includes the net farm oilseed response and the crusher response through variable extraction rates. Retail product price was chosen to estimate price responsiveness between the wholesale levels and to avoid wholesale oil price measurement problems. Equation B-2 was estimated for cottonseed oil (Table B-7) and mustard-rapeseed oils (Table B-9). Both versions of Model I demonstrate the striking lack of edible oil production response to price changes.

Forecast Model II was specified as Model I, minus the price variable:

$$LQ = f + h^{*}LY + i^{*}T + w \qquad [B \cdot 3]$$

Model II estimates the change in oil production as yield changes, net of the trend effect, and allows some speculation about changes in yield under a price decontrol scenario. In general, however, Pakistan's past edible oil production performance has been dismal and, lacking clear signs of positive supply response from the past future market behavior cannot forecast with confidence.

Cottonseed Oil Supply. Model II regression results for cottonseed supply are summarized in Table B-8. The engineering specification indicates that aggregate supply response has been elastic (1.16) with respect to yield.

Mustard-rapeseed Oil Supply. In stark contrast, the mustard-rapeseed oil supply model, Table B-10, indicates virtually no relationship between supply and yield.

TABLE B-7. COTTONSEED OIL SUPPLY FORECAST MODEL I

NAME		MEAN	STD. DEV.
Ln (PRICE)	LP	2.190	.286
Ln (YIELD)	LY	4.129	.206
TREND	T	7.000	3.894
Ln (QNTY)	LQ	4.828	.218

DEPENDENT VARIABLE: LQ

VAR.	REGRESSION COEFFICIENT	STD. ERROR	T(DF=9)	PROB.	PARTIAL r^2
LP	−.241	.125	−1.932	.08534	.2932
LY	1.064	.086	12.402	.00000	.9447
T	.032	8.0310E−03	4.013	.00305	.6515
CONSTANT	.736				

STD. ERROR OF EST. = .045
R SQUARED = .9679
MULTIPLIE R = .9838

ANALYSIS OF VARIANCE TABLE

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F RATIO	PROB.
REGESSION	.553	3	.184	90.471	4.851 − 07
RESIDUAL	.018	9	2.0374E − 03		
TOTAL	.571	12			

	OBSERVED	CALCULATED	RESIDUAL	STANDARDIZED RESIDUALS −2.0 0 2.0
1	5.063	5.052	.011	
2	5.037	5.022	.015	
3	4.942	4.986	−.045	
4	4.844	4.760	.085	
5	4.644	4.634	.010	
6	4.466	4.479	−.013	
7	4.745	4.807	−.062	
8	4.533	4.585	−.052	
9	4.970	4.959	.011	
10	4.942	4.958	−.016	
11	4.977	4.956	.020	
12	5.069	5.067	1.5989E−03	
13	4.533	4.498	.035	

DURBIN-WATSON TEST = 1.9824

TABLE B-8. COTTONSEED OIL SUPPLY FORECAST MODEL II

NAME		MEAN	STD. DEV.
Ln (YIELD)	LY	4.129	.206
TREND	T	7.000	3.894
Ln (QNTY)	LQ	4.828	.218

DEPENDENT VARIABLE: LQ

VAR.	REGRESSION COEFFICIENT	STD. ERROR	T(DF=9)	PROB.	PARTIAL r^2
Ly	1.155	.081	14.241	.00000	.9530
T	019	4.2840E–03	4.331	.00149	.6522
CONSTANT	–.071				

STD. ERROR OF EST. = .051
R SQUARED = .9546
MULTIPLE R = .9770

ANALYSIS OF VARIANCE TABLE

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F RATIO	PROB.
REGRESSION	.545	2	.273	105.101	1.931E–07
RESIDUAL	.026	10	2.5944E–03		
TOTAL	.571	12			

	OBSERVED	CALCULATED	RESIDUAL	STANDARDIZED RESIDUALS –2.0 0 2.0
1	5.063	5.023	.040	
2	5.037	4.983	.054	
3	4.942	4.986	–.045	
4	4.844	4.788	.056	
5	4.644	4.671	–.026	
6	4.466	4.487	–.021	
7	4.745	4.825	–.080	
8	4.533	4.572	–.040	
9	4.970	4.986	.016	
10	4.942	4.971	–.029	
11	4.977	4.954	.023	
12	5.069	5.058	.011	
13	4.533	4.459	.074	

DURBIN-WATSON TEST = 1.5245

TABLE B-9. MUSTARD/RAPESEED OIL SUPPLY FORECAST MODEL I

NAME		MEAN	STD. DEV.
Ln(PRICE)	LP	2.011	.397
Ln (YIELD)	LY	5.076	.072
TREND	T	7.000	3.894
Ln (QNTY)	LQ	4.307	.078

DEPENDENT VARIABLE: LQ

VAR.	REGRESSION COEFFICIENT	STD. ERROR	T(DF=9)	PROB.	PARTIAL r^2
LP	−.174	.116	−1.509	.16561	.2019
LY	−.380	.663	−.573	.58071	.0352
T	8.8475E−03	.019	.465	.65265	.0235
CONSTANT	6.524				

STD. ERROR OF EST. = .058
R SQUARED = .5850
MULTIPLE R = .7649

ANALYSIS OF VARIANCE TABLE

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F RATIO	PROB.
REGRESSION	.043	3	.014	4.230	.0401
RESIDUAL	.030	9	3.3721E−03		
TOTAL	.073	12			

	OBSERVED	CALCULATED	RESIDUAL	STANDARDIZED RESIDUALS −2.0 0 2.0
1	4.331	4.407	.076	
2	4.431	4.413	.017	
3	4.382	4.380	1.7810E−03	
4	4.407	4.313	.094	
5	4.248	4.300	−.051	
6	4.317	4.316	1.1296E−03	
7	4.419	4.324	.095	
8	4.220	4.267	−.048	
9	4.234	4.260	−.026	
10	4.263	4.241	.021	
11	4.263	4.274	.012	
12	4.248	4.259	−.011	
13	4.234	4.242	−7.475E−03	

DURBIN-WATSON TEST = 2.4526

TABLE B-10. MUSTARD/RAPESEED OIL SUPPLY FORECAST MODEL II

NAME		MEAN	STD. DEV.
Ln (YIELD)	LY	5.076	.072
TREND	T	7.000	3.894
Ln (QNTY)	LQ	4.307	.078

DEPENDENT VARIABLE: LQ

VAR.	REGRESSION COEFFICIENT	STD. ERROR	T(DF=9)	PROB.	PARTIAL r^2
Ly	.029	.062	.046	.96442	2.09161E−04
T	−.14	.012	−1.216	.25196	.1288
CONSTANT	4.259				

STD. ERROR OF EST. = .062
R SQUARED = .4801
MULTIPLE R = .6929

ANALYSIS OF VARIANCE TABLE

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F RATIO	PROB.
REGRESSION	.035	2	.018	4.617	.0380
RESIDUAL	.038	10	3.8027E−03		
TOTAL	.073	12			

	OBSERVED	CALCULATED	RESIDUAL	STANDARDIZED RESIDUALS −2.0 0 2.0
1	4.331	4.391	−.061	* |
2	4.431	4.377	.053	| *
3	4.382	4.361	.021	| *
4	4.407	4.349	.057	| *
5	4.248	4.335	−.87	* |
6	4.317	4.322	−4.308E−03	| *
7	4.419	4.307	.111	| *
8	4.220	4.294	− 074	* |
9	4.234	4.279	−.045	* |
10	4.263	4.266	−3.692E−03	| *
11	4.263	4.252	.011	| *
12	4.248	4.239	9.2374E−03	| *
13	4.234	4.223	.011	| *

DURBIN-WATSON TEST = 2.4606

Domestic Oil Production Forecasts. Alternative cottonseed and cottonseed-sunflower oil supply forecasts are summarized in Table B-11. In the steady state scenario, an average yield of 62.1 kilograms per hectare is assumed for the 1983 benchmark instead of the actual, abnormal yield (Tables A-1 and B-1). Assuming future yields decrease at an annual rate of 2.5 percent, future cottonseed oil supply is forecast to decline at an annual rate of 1.1 percent. In this scenario, the cotton sector is assumed to become more lethargic and sunflower production does not reach sustained momentum.

The price decontrol scenario assumes that the average yield of cotton and all non-traditional oilseed crops increases 3 percent per annum to about 86 kilograms per hectare by 1994, when the crop mix would be two million hectares of cotton and 0.5 million hectares of non-traditional oil if prices are decontrolled throughout the marketing chain. The new incentives are forecast to increase the supply of cottonseed oil and other non-traditional oils at an annual rate of 5.4 percent.

The mustard-rapeseed oil supply forecast does not include a price decontrol scenario because those oils have been traded freely in the past and no future controls are expected (Table B-12). Although yields increased at an annual rate of 1.7 percent during the past decade, the regression model's trend coefficient is negative (Table B-10). These opposing effects result in a net forecast decline in supply at an annual rate of 1.3 percent. This forecast is consistent with the steady decline in mustard-rapeseed acreage over the past decade, while supply has been relatively steady.

Total edible oil production forecasts are presented in Table B-13. The steady state scenario forecasts a future decline in domestic edible oil supply at an annual rate of 1.2 percent. Conversely, the price decontrol scenario forecasts future supplies to increase at an annual rate of about 3.6 percent, or produce an additional 100,000 tons of oil per year by 1994.

Import Forecasts

The major conclusions of this Annex are summarized in Table B-14. Under steady state assumptions, edible oil imports during the next decade are forecast to increase at an annual rate of about 13.1 percent to about 2.6 million tons in 1994. If edible oils price decontrol policies are implemented throughout the decade, imports will increase at an annual rate of about 10.4 percent to about 2 million tons in 1994.

TABLE B-11. COTTONSEED-SUNFLOWER OIL SUPPLY FORECASTS, 1984-1994

.....STEADY STATE ASSUMPTIONS.....

PREDICTOR	'83 BASE	GROWTH RATE(%)	COEFFICIENT
			−.0705727
YIELD	62.1	−2.5	1.1548039
TREND	13	−1.1	.0185534

YEAR	FORECAST SUPPLY (a)	YIELD	TREND
1983	140	62.1	13
1984	138	61	14
1985	137	59	15
1986	135	58	16
1987	134	56	17
1988	132	55	18
1989	131	53	19
1990	130	52	20
1991	128	51	21
1992	127	49	22
1993	125	48	23
1994	124	47	24

.....PRICE DECONTROL ASSUMPTIONS.....

PREDICTOR	'83 BASE	GROWTH RATE(%)	COEFFICIENT
			−.0705727
YIELD	62.1	3	1.1548039
TREND	13	5.37	.0185534

YEAR	FORECAST SUPPLY (b)	YIELD	TREND
1983	140	62.1	13
1984	147	64	14
1985	155	66	15
1986	163	68	16
1987	172	70	17
1988	182	72	18
1989	191	74	19
1990	202	76	20
1991	213	79	21
1992	224	81	22
1993	236	83	23
1994	249	86	24

Notes :

(a) Virtually all oil supply is assumed due to the cotton sector, which will continue to stagnate.

(b) By 1994, the oilseed crop mix is assumed to be approximately two million hectares of cotton and 0.5 million hectares of non-traditional oilseeds.

TABLE B-12. MUSTARD-RAPESEED OIL SUPPLY FORECASTS, 1984-1994

.....STEADY STATE ASSUMPTIONS.....

PREDICTOR	'83 BASE	GROWTH RATE (%)	COEFFICIENT
			4.2590125
YIELD	170	1.7	.0293798
TREND	13	−1.3	.0143873

YEAR	FORECAST SUPPLY (a)	YIELD	TREND
1983	68	170	13
1984	67	173	14
1985	66	176	15
1986	65	179	16
1987	65	182	17
1988	64	185	18
1989	63	188	19
1990	62	191	20
1991	61	195	21
1992	60	198	22
1993	59	201	23
1994	59	205	24

TABLE B-13. TOTAL EDIBLE OIL PRODUCTION FORECASTS, 1984-1994

.....STEADY STATE ASSUMPTIONS.....

YEAR	COTTONSEED OIL	MUSTARD RAPESEED OIL	TOTAL EDIBLE OIL SUPPLY
		1000 MT	
1983	140	68	208
1984	138	67	205
1985	137	66	203
1986	135	65	200
1987	134	65	199
1988	132	64	196
1989	131	63	194
1990	130	62	192
1991	128	61	189
1992	127	60	187
1993	125	59	184
1994	124	59	183

.....PRICE DECONTROL ASSUMPTIONS.....

YEAR	COTTONSEED-SUNFLOWER OIL	MUSTARD-RAPESEED OIL	TOTAL EDIBLE OIL SUPPLY
1983	140	68	208
1984	147	67	214
1985	155	66	221
1986	163	65	228
1987	172	65	237
1988	182	64	246
1989	191	63	254
1990	202	62	264
1991	213	61	274
1992	224	60	284
1993	236	59	295
1994	249	59	308

TABLE B-14. TOTAL EDIBLE OIL IMPORT FORECASTS, 1984-1994

.....STEADY STATE ASSUMPTIONS.....

YEAR	TOTAL DEMAND	TOTAL PRODUCTION	TOTAL EDIBLE OIL IMPORTS
	..... 1000 MT		
1983	874	208	666
1984	965	205	760
1985	1067	203	864
1986	1182	200	982
1987	1310	199	1111
1988	1454	196	1258
1989	1615	194	1421
1990	1794	192	1602
1991	1995	189	1806
1992	2220	187	2033
1993	2472	184	2288
1994	2753	183	2570

.....PRICE DECONTROL ASSUMPTIONS.....

YEAR	TOTAL DEMAND	TOTAL PRODUCTION	TOTAL EDIBLE OIL IMPORTS
1983	874	208	666
1984	950	214	736
1985	1035	221	814
1986	1128	228	900
1987	1230	237	993
1988	1343	246	1097
1989	1466	254	1212
1990	1602	264	1338
1991	1751	274	1477
1992	1916	284	1632
1993	2096	295	1801
1994	2294	308	1986

ANNEX C

IMPORTED EDIBLE OIL STORAGE CAPACITY AND FLOWS

TABLE C-1. CURRENT ESTIMATED KARACHI EDIBLE OIL STORAGE

TERMINALS	EAST WHARF	WEST WHARF	TOTAL
	.....	TONS	
International Tank Terminals Limited		55000	55000
Pakistan House International Limited	28070		28070
Karachi Tank Terminals Limited	36000		36000
Cosmopolitan Development Corporation Ltd.	35000		35000
F & D Bulk Storage Limited	24500		24500
Habib Sugar Mills Limited	15850		15850
Haji Dossa Limited	12500		12500
Molasses Export Company Limited	50000		50000
Pakistan Molasses Company Limited	35000		35000
Home Product International Limited	18600		18600
Karachi Bulk Storage & Terminals Limited	25000		25000
TOTAL TONNAGE OF STORAGE	280520	55000	335520

Source : GCP, as of August 7, 1984.

TABLE C-2. MONTHLY UTILIZATION OF TANK TERMINAL AND SHIP STORAGE

MONTH		TANK CAPACITY. OCCUPIED	TANK CAPACITY. UNOCCUPIED	TANK CAPACITY. TOTAL	ENDING STOCK	TONS ON SHIPS	% OF TANK CAPACITY. END STOCK	% OF TANK CAPACITY. SHIP STOCK
		1000 TONS OF OIL						
1980	JUL	111800		111800	28347	61168	25	55
	AUG	111800		111800	53292	60342	48	54
	SEP	111800		111800	102126	90463	91	81
	OCT	111800		111800	129842	70012	116	63
	NOV	111800		111800	117899	25397	105	23
	DEC	95163	16637	111800	95163		85	0
1981	JAN	100912	10888	111800	100912	21632	90	19
	FEB	97355	14445	111800	97355	15779	87	14
	MAR	83388	28412	111800	83388	20609	75	18
	APR	61470	50330	111800	61470	19374	55	17
	MAY	56072	55728	111800	56072	40341	50	36
	JUN	49083	62717	111800	49083	38768	44	35
	JUL	43090	81910	125000	43090	45240	34	36
	AUG	38495	86505	125000	38495	36379	31	29
	SEP	94777	30223	125000	94771	101550	76	81
	OCT	100071	24929	125000	100071	54855	80	44
	NOV	86716	38384	125000	86716	20787	69	17
	DEC	127297	33703	161000	108867	42173	68	26
1982	JAN	121972	39028	161000	120296	34791	75	22
	FEB	144807	16193	161000	112362	16405	70	10
	MAR	151565	9435	161000	114659	31129	71	19
	APR	144033	16967	161000	98051	21258	61	13
	MAY	139675	21325	161000	74786	25511	46	16
	JUN	113935	47065	161000	45023	23220	28	14
	JUL	108064	52936	161000	53311	49775	33	31
	AUG	123656	37344	161000	67033	63749	42	40
	SEP	135625	25375	161000	97843	59896	61	37
	OCT	142681	18319	161000	99785	48942	62	30
	NOV	131186	29814	161000	101285	35500	63	22
	DEC	152000		152000	120171	30944	79	20
1983	JAN	152000		152000	137790	36895	91	24
	FEB	152000		152000	121833		80	0
	MAR	152000		152000	131279	32771	86	22
	APR	152000		152000	117837	16048	78	11
	MAY	152000		152000	98790	21972	65	14
	JUN	100000	52000	152000	55481	21000	37	14
	JUL	72427	118273	190700	72427	99242	38	52
	AUG	113559	77141	190700	113559	90000	60	47
	SEP	88422	102278	190700	88422	119043	46	62
	OCT	93762	107238	201000	93762	76963	47	38
	NOV	90608	110392	201000	90608	36000	45	18
	DEC	67352	133648	201000	67352	98950	34	49
1984	JAN	48953	152047	201000	48953	144500	24	72
	FEB	57063	143937	201000	57063	140425	28	70
	MAR	61845	139155	201000	61845	119200	31	59
	APR	54500	146500	201000	54500	118000	27	59
	MAY	51929	149071	201000	51929	192050	26	96
	JUN	68774	132226	201000	68774	184600	34	92

Source. GCP

TABLE C-3. MONTHLY STOCKS AND FLOW OF EDIBLE OIL IMPORTS FOR THE GCP 1980-1984

		BEGINNING STOCKS			IMPORTS			UTILIZATION			ENDING STOCKS		
	MONTH	SOYA	PALM	TOTAL	SOYA	PALM	TOTAL	SOYA	PALM	TOTAL	SOYA	PALM	TOTAL
		1000 TONS											
1980	JUL	3494	20341	23835	41520	20061	61581	25760	31303	57063	19254	9099	28353
	AUG	19254	9099	28353	18000	42892	60892	20317	15650	35967	16937	36341	53278
	SEP	16937	36341	53278	65696	25164	90860	18638	23368	42006	63995	38137	102132
	OCT	63995	38137	102132	54837	15175	70012	22704	19592	42296	96128	33720	129848
	NOV	96128	33720	129848		25397	25397	16637	20703	37340	79491	38414	117905
	DEC	79491	38414	117905			0	8884	13852	22736	70607	24562	95169
1981	JAN	70607	24562	95169		21632	21632	5035	10848	15883	65572	35346	100918
	FEB	65572	35346	100918		15779	15779	7533	11803	19336	58039	39322	97361
	MAR	58039	39322	97361		20609	20609	15462	19114	34576	42577	40817	83394
	APR	42577	40817	83394	14250	5124	19374	21677	19615	41292	35150	26326	61476
	MAY	35150	26326	61476	14501	25840	40341	21731	24008	45739	27920	28158	56078
	JUN	27920	28158	56078	23877	14891	38768	19486	26271	45757	32311	16778	49089
	JUL	32311	16778	49089	21865	23375	45240	25040	26193	51233	29136	13960	43096
	AUG	29136	13960	43096	15692	20687	36379	20661	20313	40974	24167	14334	38501
	SEP	24167	14334	38501	65508	36042	101550	21966	23302	45268	67709	27074	94783
	OCT	67709	27074	94783	29935	24920	54855	22200	27361	49561	75444	24633	100077
	NOV	75444	24633	100077	15750	5037	20787	13476	20666	34142	77718	9004	86722
	DEC	77718	9004	86722	15654	26519	42173	6458	15194	21652	86914	20329	107243
1982	JAN	86914	20329	102643	18618	16173	34791	7189	10439	17628	98343	26063	124406
	FEB	98343	26063	124406		16405	16405	10995	13344	24339	87348	29124	116472
	MAR	87348	29124	116472	19982	11147	31129	16493	12339	28832	90837	27932	118769
	APR	90837	27932	118769		21258	21258	18292	19574	37866	72545	29616	102161
	MAY	72545	29616	102161	19993	5518	25511	25576	23300	48876	66962	11834	78796
	JUN	66962	11834	78796		23220	23220	29339	23644	52983	37623	11410	49033
	JUL	37623	11410	49033	23312	26463	49775	22117	19370	41487	38818	18503	57321
	AUG	38818	18503	57321	26102	37647	63749	26883	23139	50022	38037	33011	71048
	SEP	38037	33011	71048	40064	19832	59896	20900	18167	39067	57201	34676	91877
	OCT	57201	34676	91877	38841	10101	48942	24700	22300	47000	71342	22477	93819
	NOV	71342	22477	93819	20000	15500	35500	15000	19000	34000	76342	16977	95319
	DEC	76342	18977	95319	20967	9977	30944	11038	11016	22054	86271	17938	104209
1983	JAN	86271	17938	104209	31495	5400	36895	8983	10288	19271	108783	13050	121833
	FEB	108783	13050	121833			0	7686	8270	15956	101097	4780	105877
	MAR	101097	4780	105877		32771	32771	10835	12490	23325	90262	25061	115323
	APR	90262	25061	115323		16048	16048	14084	15406	29490	76178	25703	101881
	MAY	76178	25703	101881		21972	21972	18601	22418	41019	57577	25257	82834
	JUN	57577	25257	82834		5491	5491	22226	26574	48800	35351	4174	39525
	JUL	35351	4174	39525	15099	54956	70055	24210	26869	51079	26240	32261	58501
	AUG	26240	32261	58501	76825	16992	93817	27695	24990	52685	75370	24263	99633
	SEP	75370	24263	99633		20632	20632	21354	24415	45769	54016	20480	74496
	OCT	54016	20480	74496	42291	29705	71996	27610	39046	66656	68697	11139	79836
	NOV	68697	11139	79836	28848	30165	59013	31478	30089	62167	66067	10615	76682
	DEC	66067	10615	76682		29628	29628	29781	23103	51884	36286	17140	53426
1984	JAN	36286	17140	53426		40045	40045	31787	26657	58444	4499	30528	35027
	FEB	4499	30528	35027	58111	5847	63958	36997	18851	55848	25613	17524	43137
	MAR	25613	17524	43137	35747	24484	60231	36490	18959	55449	24870	23049	47919
	APR	24870	23049	47919	42577	17955	60532	44218	23659	67877	23229	17345	40574
	MAY	23229	17345	40574	40881	25811	66612	41697	27486	69183	22333	15670	38003
	JUN	22333	15670	38003	44591	40221	84812	38721	29246	67967	28203	26645	54848

Source : GCP

TABLE C-4. ANNUAL STOCKS AND FLOW OF EDIBLE OIL IMPORTED FOR THE GCP, 1980-1984

YEAR	BEGINNING STOCKS			IMPORTS			UTILIZATION			ENDING STOCKS		
	SOYA	PALM	TOTAL	SOYA	PALM	TOTAL	SOYA	PALM	TOTAL	SOYA	PALM	TOTAL
	1000 TONS											
1980	48264	30882	79146	23681	232564	465245	203864	236127	439991	77081	27319	104400
1981	77081	27319	104400	222997	230301	453298	217685	235669	453354	82393	21951	104344
1982	82393	21951	104344	200781	201202	401983	203053	208438	411491	80121	14715	94836
1983	90121	14715	94836	384890	336441	721331	392038	313970	706008	72973	37186	110159

Note : Beginning stocks, 1980 are annual averages from Table C-3.

Source : GCP

ANNEX D

VEGETABLE GHEE PRODUCTION PERFORMANCE

TABLE D-1. GCP PLANTS BY CAPACITY AND LOCATION, 1983-1984

	UNIT NAME	CAPACITY ..TONS...	LOCATION
1	United Industries Limited	28000	Faisalabad
2	Kakakhel Industries	29000	Faisalabad
3	Morafco Industries	19000	Faisalabad
4	Sargroh Vegetable Ghee & General Mills	21000	Faisalabad
5	Fazal Vegetable Ghee Mills	18000	Islamabad
6	Sh. Fazal Rehman & Sons Limited	28000	Multan
7	A&B Industrial Gases Limited	14500	Multan
8	Cresent Factories Limited	20000	Chichawatni/Sahiwal
9	Suraj Ghee Industries	24000	Sheikhupura
10	Kohinoor Oil Mills Limited	27000	Kalashakaku
11	Punjab Vegetable Ghee & General Mills (Closed)	10000	Lahore
12	Universal Vegetable Ghee & General Mills	24000	Sheikhupura
13	Khyber Vegetable Ghee Mills (Closed)	8000	Lahore
14	A&B Oil Industries Limited	15000	Karachi
15	Asaf Industries Limited	13000	Shikarpur
16	Bengal Vegetable Ghee Mills	13000	Karachi
17	Burma Oil Mills Limited	32000	Karachi
18	E.M. Oil Mills Limited	32000	Karachi
19	Hydari Industries Limited	15000	Hyderabad
20	Maqbool Company Limited	12500	Karachi
21	Wazir Ali Industries Limited	30000	Hyderabad
22	Chiltan Ghee Mills	9000	Quetta
23	Associated Industries Limited	30000	Nowshera
24	Bara Vegetable Ghee Mills	10000	Bara
25	Dargai Vegetable Oil Processing Industries	11000	Dargai
26	Haripur Vegetable Oil Processing Industries	11000	Haripur
	TOTAL CAPACITY	504000	

Source : GCP Technical Department

TABLE D-2. MONTHLY COTTONSEED OIL PROCUREMENT BY THE GCP, 1980-1983

MONTH	1980	1981	1982	1983
	.....TONS.....			
JUL	184	567	257	285
AUG	91	400	246	187
SEP	621	1493	665	52
OCT	4873	7314	4704	2450
NOV	15541	21365	22494	6019
DEC	26815	34324	29877	9295
JAN	27150	25704	29420	6997
FEB	15464	16215	17568	5551
MAR	9351	11105	13452	4309
APR	3927	4176	5685	2055
MAY	1226	1271	2571	609
JUN	1235	534	1194	3368
TOTAL	106478	124468	128133	41177

Notes: Procurement prices per 37.324 kg. maund were fixed as follows:
Rs 200, from August 5, 1974
Rs 250, from September 23, 1980
Rs 320, from November 26, 1983

Source: GCP Technical Department

TABLE D-3. GHEE PRODUCTION PERFORMANCE BY SECTOR, 1976-1982

YEAR/SECTOR	TONS		CAPACITY	PERCENT VEGETABLE OIL BLEND(a)				PROCESS
	CAPACITY	PRODUCTION	UTILIZATION	SBO	PO	CSO	RSO/SF	LOSS (b)
1976								
NATIONALIZED	293500	288269	98	45	35	18	2	7.42
NON-NATIONALIZED	40500	40806	101	41	34	22	3	8.06
TOTAL	334000	329075	99	44	35	18	2	7.50
1977								
NATIONALIZED	310000	319385	103	35	30	25	1	7.44
NON-NATIONALIZED	49500	44627	90	30	37	32	1	7.24
TOTAL	359500	364012	101	34	39	26	1	7.42
1978								
NATIONALIZED	325500	378606	116	42	43	15		5.75
NON-NATIONALIZED	51000	60156	118	47	41	12		6.00
TOTAL	376500	438762	117	43	42	15		5.76
1979								
NATIONALIZED	382500	403917	106	39	41	20		7.26
NON-NATIONALIZED	68500	69214	101	42	39	19		7.68
TOTAL	451000	473131	105	40	40	20		7.32
1980								
NATIONALIZED	442000	459701	104	37	44	20		3.08
NON-NATIONALIZED	73000	66993	92	36	46	18		4.26
TOTAL	515000	526694	102	37	44	20		3.24
1981								
NATIONALIZED	477000	485094	102	38	40	22		2.80
NON-NATIONALIZED	83500	83125	100	39	40	21		3.31
TOTAL	560500	568219	101	38	40	22		2.88
1982								
NATIONALIZED	500000	451785	90	38	39	23		2.81
NON-NATIONALIZED	92500	81057	88	36	40	25		3.24
TOTAL	592500	532842	90	37	39	23		2.87

Notes: (a) Oil ingredients are: Soybean Oil (SBO), Palm Oil (PO), Cottonseed Oil (CSO), and Rapeseed Oil/Sunflower Oil (RSO/SF). Percentages may not total 100 due to rounding.

(b) Processing loss is total oil used minus ghee produced, as a percent of total oil used.

Source: GCP

TABLE D-4. MONTHLY UTILIZATION OF VEGETABLE OILS BY GCP SUPPLIED UNITS

MONTH	SOYA OIL	PALM OIL	COTTONSEED OIL	TOTAL
		TONS		
1980 JUL	25760	31303	184	57247
AUG	20317	15650	91	36058
SEP	18638	23368	621	42627
OCT	22704	19592	4873	47169
NOV	16637	20703	15541	52881
DEC	8884	13852	26815	49551
1981 JAN	5035	10848	27150	43033
FEB	7533	11803	15464	34800
MAR	15462	19114	9351	43927
APR	21677	19615	3927	45219
MAY	21731	24008	1226	46965
JUN	19486	26271	1235	46992
JUL	25040	26193	567	51800
AUG	20661	20313	400	41374
SEP	21966	23302	1493	46761
OCT	22200	27361	7314	56875
NOV	13476	20666	21365	55507
DEC	6458	15194	34324	55976
1982 JAN	7189	10439	25704	43332
FEB	10995	13344	16215	40554
MAR	16493	12339	11105	39937
APR	18292	19574	4176	42042
MAY	25576	23300	1271	50147
JUN	29339	23644	534	53517
JUL	22117	19370	257	41744
AUG	26883	23139	246	50268
SEP	20900	18167	665	39732
OCT	24700	22300	4704	51704
NOV	15000	19000	22494	56494
DEC	11038	11016	29877	51931
1983 JAN	8983	10288	29420	48691
FEB	7686	8270	17568	33524
MAR	10835	12490	13452	36777
APR	14084	15406	5685	35175
MAY	18601	22418	2571	43590
JUN	22226	26574	1194	49994
JUL	24210	26869	285	51364
AUG	27695	24990	187	52872
SEP	21354	24415	52	45821
OCT	27610	39046	2450	69106
NOV	31478	30689	6019	68186
DEC	29781	23103	9295	62179
1984 JAN	31787	26657	6997	65441
FEB	36997	18851	5551	61399
MAR	36490	18959	4309	59758
APR	44218	23659	2055	69932
MAY	41697	27486	609	69792
JUN	38721	29246	3368	71335

Source: GCP

TABLE D-5. PAKISTAN REFINERY CAPACITY BY PROVINCE

	PUBLIC SECTOR COOKING			PRIVATE SECTOR COOKING			TOTAL COOKING		
	GHEE	OIL	TOTAL	GHEE	OIL	TOTAL	GHEE	OIL	TOTAL
	1000 TONS								
PUNJAB									
OPERATING PLANTS	11*	0	11	7	3	10	18	3	21
CAPACITY	252.5	0	252.5	113.5	42	155.5	366	42	408
NON-OPERATING PLANTS	0	0	0	0	0	0	0	0	0
CAPACITY	0	0	0	0	0	0	0	0	0
SIND									
OPERATING PLANTS	8	0	8	3	0	3	11	0	11
CAPACITY	162.5	0	162.5	33	15	48	195.5	15	210.5
NON-OPERATING PLANTS	0	0	0	1	2	3	1	2	3
CAPACITY	0	0	0	9	18	27	9	18	27
BALUCHISTAN									
OPERATING PLANTS	1	0	1	0	0	0	1	0	1
CAPACITY	9	0	9	0	0	0	9	0	9
NON-OPERATING PLANTS	0	0	0	2	0	2	2	0	2
CAPACITY	0	0	0	18	0	18	18	0	18
N.W.F.P.									
OPERATING PLANTS	4	0	4	1	2	3	5	2	7
CAPACITY	62	0	62	27	18	45	89	18	107
NON-OPERATING PLANTS	0	0	0	0	0	0	0	0	0
CAPACITY	0	0	0	0	0	0	0	0	0
AZAD KASHMIR									
OPERATING PLANTS	0	0	0	2	0	2	2	0	2
CAPACITY	0	0	0	18	0	18	18	0	18
NON-OPERATING PLANTS	0	0	0	0	0	0	0	0	0
CAPACITY	0	0	0	0	0	0	0	0	0
PAKISTAN									
OPERATING PLANTS	24	0	24	13	5	18	37	5	42
CAPACITY	486	0	486	191.5	75	266.5	677.5	75	752.5
NON-OPERATING PLANTS	0	0	0	3	2	5	3	2	5
CAPACITY	0	0	0	27	18	45	27	18	45

Notes: *Two plants with 10,000 tons of capacity in Lahore closed January, 1984.
Total Sanctioned Capacity: 797.5. Total Non-Sanctioned Capacity: 56. Grand Total Capacity: 853.5.

Source: Compiled from GCP internal reports

ANNEX E

EDIBLE OIL IMPORT RICE VARIABLITY

As Pakistan's edible oil requirements have increasingly depended on imports, its foreign exchange costs have risen and become more volatile. Palm oil has emerged as a major source of import cost variablity because of several simultaneous developments in the world market. Palm oil production, particularly in Malaysia, has grown rapidly during the past decade, but output variability has increased as palm crops initially respond to new technologies with sharply higher yields, then suffer production declines as the oil-palm's metabolism is overtaxed. Palm oil is gaining a large share of the world oil market and oil processors who tend to specialize in palm oil-based manufacturing processes find it increasingly difficult to substitute other less expensive oils, even when palm oil supplies are low. Finally, in the major oil-palm production countries, palm oil trading is quite risky because of price manipulation in commodity exchanges and inadequate legal safeguards for palm oil contracts. These anomalies have resulted in an imperfect world palm oil market without accurate price data.

Soybean Oil Price Variability

In sharp contrast to the palm oil market, the world soybean oil market is supported by many reliable commodity exchanges which produce efficient, accurate spot price quotations. These exchanges also have mature futures markets that serve as a valuable price discovery tool for edible oil hedgers.

The U.S. soybean market has been a major factor in the world edible oil market for the last three decades. Although the U.S. is a major exporter of soybean products, domestic prices are quite responsive to international market forces. Decatur, Illinois is commonly used to establish a basis for soybean oil since it lies near the center of most U.S. soybean production. Table E-1 lists monthly wholesale soybean oil prices for 1965 through 1981. The top portion of the table shows monthly price variation over each crop year and annual average prices. The bottom portion describes annual price cycles indexed to an October base. Since the U.S. soybean harvest is finished by the end of November, it might be assumed that November-April prices would normally fall below the October price, then rise during summer months as stocks from the last harvest are depleted. The index numbers refute this assumption and highlight the difficulties faced by traders wishing to establish futures positions over the next year based on harvest prices. The mean monthly index number increases slightly throughout the crop year, but the variance of prices (standard deviations) increases throughout the year.

TABLE E-1. MONTHLY SOYBEAN OIL PRICES, CRUDE, TANKS F.O.B., DECATUR

CROP YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ANNUAL AVERAGE
	CENTS PER POUND												
1965	11.50	11.20	11.20	11.90	12.00	11.30	11.60	11.30	11.20	12.30	14.10	12.30	11.85
1966	10.90	10.80	10.60	10.30	10.30	10.30	10.30	10.30	9.80	9.10	9.60	9.30	10.13
1967	8.80	8.60	8.60	8.70	9.50	9.10	8.80	8.70	7.80	7.40	7.50	7.50	8.42
1968	7.30	7.90	8.10	8.60	8.90	8.80	8.40	8.40	7.80	8.20	8.90	9.70	8.42
1969	10.60	10.90	9.60	9.60	11.50	12.20	12.20	11.30	11.10	11.50	11.60	12.10	11.18
1970	14.00	13.90	12.40	12.30	12.10	12.20	11.20	11.40	12.80	14.50	14.50	12.80	12.84
1971	13.20	12.50	11.70	10.90	11.00	11.70	11.90	11.40	10.70	10.30	10.10	9.80	11.27
1972	9.60	9.60	9.70	10.10	13.00	13.90	15.00	17.10	19.30	22.40	33.50	24.30	16.46
1973	23.10	20.60	26.00	28.60	36.40	30.20	28.20	29.40	31.60	40.50	43.30	40.70	31.53
1974	42.30	40.40	38.00	33.60	29.40	29.10	28.20	23.60	23.30	27.50	28.50	24.40	30.69
1975	21.40	18.90	16.80	16.17	16.33	16.56	16.32	15.77	17.62	20.87	20.35	22.46	18.30
1976	20.73	21.75	20.95	20.86	22.39	26.46	29.60	31.27	28.34	23.77	21.13	19.17	23.87
1977	18.76	20.99	22.64	20.97	21.65	26.62	26.80	28.79	26.87	25.87	26.31	27.80	24.51
1978	26.70	24.10	25.30	25.76	27.30	27.78	26.73	26.28	27.57	29.07	29.21	29.97	27.15
1979	27.89	27.79	26.20	23.59	23.40	22.06	20.27	20.76	21.65	26.21	25.92	26.11	24.32
1980	25.05	26.69	23.67	22.96	21.98	23.10	23.40	21.57	21.34	22.82	20.77	19.39	22.73
1981	19.65	19.85	18.85	18.44	18.19	18.52	19.66	20.55	19.35	19.04	17.86	17.42	18.95
	DECATUR MONTHLY PRICES, OCTOBER = 100												
CROP YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
1965	100	97	97	103	104	98	101	98	97	107	123	107	
1966	100	99	97	94	94	94	94	94	90	83	88	85	
1967	100	98	98	99	108	103	100	99	89	84	85	85	
1968	100	108	111	118	122	121	115	115	107	112	122	133	
1969	100	103	91	91	108	115	115	107	105	108	109	114	
1970	100	99	89	88	86	87	80	81	91	104	104	91	
1971	100	95	89	83	83	89	90	86	81	78	77	74	
1972	100	100	101	105	135	145	156	178	201	233	349	253	
1973	100	88	113	124	158	131	122	127	137	175	187	176	
1974	100	96	90	79	70	69	67	56	55	65	67	58	
1975	100	88	79	76	76	77	76	74	82	98	95	105	
1976	100	105	101	101	108	128	143	151	137	115	102	92	
1977	100	112	121	112	115	142	143	153	143	138	140	148	
1978	100	90	95	96	102	104	100	98	103	109	109	112	
1979	100	100	94	85	84	79	73	74	78	94	93	94	
1980	100	107	94	92	88	92	93	86	85	91	83	77	
1981	100	101	96	94	93	94	100	105	98	97	91	89	
MEAN	100	99	97	96	102	104	104	105	105	111	119	111	
St Lev	0	7	10	13	22	23	26	32	34	48	66	46	
C.V.	0	.07	.10	.14	.22	.22	.25	.30	.32	.43	.55	.42	

Note: The standard deviation and coefficient of variaton for each monthly index are shown below the mean.

Source: USDA/ERS

Soybean oil price variability can also be measured by seasonality regression models. A monthly time-series model was specified as follows:

$$P = a + b^{*}Dnov + \ldots + l^{*}Dsep + m^{*}T + u \qquad [E\text{-}1]$$

where

- P = the Decatur monthly soybean oil price (dollar per pound)
- Dmon = a monthly dummy variable for each month except October (coded "1" if the variable matches the month of the observed price, "0" otherwise)
- T = an arithmetic trend index beginning with "1" for the first crop year of observed prices
- a–n = estimated partial regression coefficients
- u = the variance of observed prices about an estimated regression path

Parameters b through l estimate differences between the October price and the price for the respective month denoted by the dummy variable. The trend parameter, m, adjusts the model for annual price trends over all observed years. Results of the price seasonality regression model are summarized in Table E-2. The model offers convincing evidence that U.S. soybean oil prices do not exhibit seasonality over several crop years. The November-June dummy variables are negative, indicating prices in those months are estimated to be lower than the October price; however, all regression coefficients for dummy variables have extremely high estimation errors (each regression coefficient is smaller than its respective standard error). The only relatively reliable parameter estimate, the trend coefficient, estimates an annual price increase of 1.1 cents per pound over the 1965-1981 period, over an estimated 1965 base price of 8.4 cents.

The annual U.S. soybean oil price trend was estimated by specifying the following semi-log model:

$$Ln(P) = a + b^{*}T + e \qquad [E\text{-}2]$$

where

- Ln(P) = the natural logarithm of the Decatur annual soybean oil price (cents per pound)
- a = the partial regression coefficient for the equation's intercept term
- b = the partial regression coefficient representing the estimated annual compound annual growth rate of soybean oil prices
- T = an arithmetic trend index beginning with "1" for the 1965 crop year
- e = the variance of observed prices about an estimated regression (trend) path

The estimation results are summarized in Table E-3. The trend parameter indicates an annual compound growth rate of about 6.9 percent over the 1965-81 period. This growth rate is very close to the estimated growth rate for Pakistan retail vegetable ghee prices during the 1971-1983 period (Annex B).

TABLE E-2. SOYBEAN OIL PRICE SEASONALITY MODEL

NAME	MEAN	STD. DEV.
NOV	.083	.277
DEC	.083	.277
JAN	.083	.277
FEB	.083	.277
MAR	.083	.277
APR	.083	.277
MAY	.083	.277
JUN	.083	.277
JUL	.083	.277
AUG	.083	.277
SEP	.083	.277
TREND	9.000	4.911
PRICE	.184	.083

(Month variables are "0,1" dummy variables. "TREND" is an annual index.)

DEPENDENT VARIABLE: PRICE

VAR.	REGRESSION COEFFICIENT	STD.ERROR	T(DF=191)	PROB.	PARTIAL r^2
NOV	−3.065E−03	.022	−.140	.88895	1.02338E−04
DEC	−6.571E−03	.022	−.300	.76469	4.70228E−04
JAN	−.011	.022	−.487	.62714	.0012
FEB	−3.612E−03	.022	−.165	.86930	1.42129E−04
MAR	−9.294E−04	.022	−.042	.96622	9.41275E−06
APR	−1.706E−03	.022	− 078	.93805	3.17095E−05
MAY	−2.122E−03	.022	− 096	.91335	4.85931E−05
JUN	−1.965E−03	.022	−.090	.92867	4.20612E−05
JUL	.012	.022	.533	.59449	.0015
AUG	.019	.022	.850	.39644	.0038
SEP	8.0824E−03	.022	.369	.71274	7.11330E−04
TREND	.011	9.1331−04	12.047	.00000	.4317
CONSTANT	084				

STD.ERROR OF EST. = .064
R SQUARED = .4369
MULTIPLE R = .6610

ANALYSIS OF VARIANCE TABLE

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F RATIO	PROB
REGRESSION	.605	12	.050	12.348	.000E+00
RESIDUAL	780	191	4.08440E−03		
TOTAL	1.385	203			

DURBIN-WATSON TEST = .1127

TABLE E-3. ANNUAL U.S. SOYBEAN OIL PRICE TREND MODEL

NAME		MEAN	STD.DEV.
TREND	T	9.0000000	5.0497525
Ln(PRICE)	LP	2.8206156	.4497140

("TREND" is an annual index, 1965 = 1, etc.)

DEPENDENT VARIABLE: LP

VAR.	REGRESSION COEFFICIENT	STD. ERROR	T(DF=15)	PROF
T	.0691754	.0144818	4.777	.00024
CONSTANT	2.1980367			

STD. ERROR OF EST. = .2925183
R SQUARED = .6034
R = .7768

ANALYSIS OF VARIANCE TABLE

SOURCE	SUM OF SQUARES	D F.	MEAN SQUARE	F RATIO	PROB.
REGRESSION	1.9523783	1	1.9523873	22.817	2.448E−04
RESIDUAL	1.2835044	15	.0855670		
TOTAL	3.2358826	16			

	OBSERVED	CALCULATED	RESIDUAL	STANDARDIZED RESIDUALS −2.0 0 2.0
1	2.472	2.267	.205116	
2	2.316	2.336	−.020886	
3	2.131	2.406	−.274953	
4	2.131	2.475	−.344129	
5	2.414	2.544	−.129787	
6	2.553	2.613	−.060524	
7	2.422	2.682	−.260120	
8	2.801	2.751	.049493	
9	3.451	2.821	.630324	
10	3.424	2.890	.534146	
11	2.907	2.959	−.052065	
12	3.173	3.028	.144481	
13	3.199	3.097	.101764	
14	3.301	3.166	.134884	
15	3.191	3.236	−.044369	
16	3.124	3.305	−.181158	
17	2.942	3.374	−.432215	

DURBIN-WATSON; TEST = .8980

Reliable soybean oil price data are readily available; however, palm oil price data are not yet standardized. Soybean and plam oil price variabilities were compared by aggregating data collected by the GCP to estimate C.I.F. Karachi oil prices. The GCP supplied estimated daily f.o.b. soybean oil and RBD (refined, bleached, deodorized) palm oil from July, 1982, through June, 1984. These data were aggregated to a monthly basis by calculating simple unweighted averages. The estimated monthly means and standard deviations are summarized in Table E-4. Both oil prices increased over the last two years, but the intramonth variations were quite volatile. Soybean oil prices varied sharply during August, 1983 as the market adjusted to reports of unfavorable weather throughout the U.S. Midwest. Palm oil prices became even more erratic during January and February, 1984, in response to Malaysian production declines and major trading irregularities in the Kuala Lumpur palm oil market.

TABLE E-4. MONTHLY F.O.B. SOYBEAN OIL AND PLAM OIL PRICES

MONTH	SOYBEAN OIL (U. S. MIDWEST) MEAN	STD. DEV.	RBD PALM OIL (MALAYSIA) MEAN	STD. DEV.
	U.S. $ PER MT			
1982 JUL	420	3.92	359	11.87
AUG	392	13.67	351	8.55
SEP	383	6.43	365	11.20
OCT	382	7.47	332	5.54
NOV	384	5.40	352	12.67
DEC	363	10.23	376	9.68
1983 JAN	364	12.96	380	4.99
FEB	384	7.86	364	5.69
MAR	388	11.71	355	10.43
APR	426	6.56	379	6.01
MAY	439	6.13	400	7.23
JUN	428	7.94	380	8.28
JUL	536	34.87	431	19.86
AUG	735	81.55	546	61.36
SEP	835	32.71	646	23.46
OCT	749	29.11	662	13.76
NOV	701	33.41	653	10.18
DEC	681	23.37	767	74.25
1984 JAN	716	16.04	1068	197.36
FEB	709	26.70	1016	127.43
MAR	771	20.20	846	62.40
APR	811	21.25	859	62.82
MAY	951	53.78	947	24.94
JUN	886	31.59	803	49.01

Source: GCP Edible Oil Import & Logistics Div.

Note: Monthly values are estimated from GCP daily data.

In general, F.O.B soybean oil and plam oil prices have been highly correlated during the past two years (Table E-5). However, it is not known how precisely the GCP estimates ocean freight rates and Midwest-New Orleans soybean oil premiums. Therefore, the estimated C.I.F. Karachi prices should reflect the variability described in Table E-4, plus additional price variances that may not accurately reflect market conditions.

TABLE E-5. MONTHLY F.O.B. SOY-PALM OIL PRICE CORRELATION MATRIX

	SP	PP	TREND
SP	1.00		
PP	.87	1.00	
TREND	90	.88	1.00

(SP = Soybean Oil Price, PP = RBD Palm Oil Price)

Critical Value (1–tail, .05) = + or – .34
Critical Value (2–tail, .05) = + or – .40

Pakistan Import Prices

Hindsight permits commodity specialists to read Table E-2 and offer vivid recollections on key changes in U.S. farm policies and U.S. and world supply and demand situations, but forecasts for prices over the next crop year are extremely difficult. If it is difficult to forecast U.S. edible oil prices, a major force in the world market, it will surely be at least as difficult to forecast Pakistan edible oil import prices.

Table E-6 presents the average price of Pakistan's edible oil imports (Table B-1) during 1971-1982 and a set of forecast prices based on a simple exponential growth model (Table E-7). The estimated trend growth rate of 6.74 percent per annum is consistent with other estimates of world edible oil price trends. Unfortunately, the model explains only 35 percent of the price variance. It should be noted that when the forecast prices are converted to maund equivalents, the forecast price of Rs 307 is close to the current domestic procurement price of Rs 320.

TABLE E-6. AVERAGE ANNUAL EDIBLE OIL IMPORT PRICES

YEAR	OBSERVED PRICE RS/KG (a)	OBSERVED PRICE RS/MD	FORECAST PRICE RS/KG (b)	FORECAST PRICE RS/MD
1971	1.63	61	3.42	128
1972	3.25	121	3.66	136
1973	5.76	215	3.91	146
1974	7.01	262	4.18	156
1975	4.34	162	4.48	167
1976	5.10	190	4.79	179
1977	5.80	216	5.12	191
1978	7.02	262	5.48	205
1979	6.64	248	5.86	219
1980	5.62	210	6.27	234
1981	5.42	202	6.71	250
1982	5.59	209	7.18	268
1983			7.68	287
1984	----------		8.21 ----	307
1985			8.79	328
1986			9.40	351
1987			10.06	375
1988			10.76	401
1989			11.51	429
1990			12.31	459
1991			13.17	492
1992			14.09	526
1993			15.07	562
1994			16.12	602

Notes: (a) Average annual oil import prices are in current rupees.

(b) Forecast equation is:

$$Ln(P_i) = 1.1616 + 0.0674^{*}(T)$$

where

Ln(P) is natural logarithm of price

(T) is a trend index, 1971 = 1, etc.

Source: Annex B, Table B-1, and Table E-7

Future Wholesale Edible Oil Price Policy

These few examples show ample evidence of world edible oil price volatility. Pakistan has not established a consistent policy for dealing with gaps between the average import price and the domestic crude oil procurement price. During 1981 and 1982, the Trading Corporation of Pakistan (TCD) imported all GCP import requirements, but not all private requirements because the average import price was below the domestic procurement price. This situation removed domestic production incentives, but is also contributed to uncertainty about the government's long range policy on edible oils.

TABLE E-7. EDIBLE OIL PRICE GROWTH RATE MODEL

NAME		MEAN	STD. DEV
TREND	T	6.5000000	3.6055513
Ln(Price)	LP	1.5999804	.0496236

("TREND" is an annual index, 1965 = 1, etc.)

DEPENDENT VARIABLE: LP

VAR.	REGRESSION COEFFICIENT	STD. ERROR	T(DF= 15)	PROB
T	.0674380	.0289122	2.333	.04187
CONSTANT	1.1616333			

STD. ERROR OF EST = .3457396
R SQUARED = .3524
R = .5936

ANALYSIS OF VARIANCE TABLE

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F RATIO	PROB.
REGRESSION	.6503478	1	.6503478	5.441	.0419
RESIDUAL	1.1953585	10	.1195358		
TOTAL	1.8457063	11			

	OBSERVED	CALCULATED	RESIDUAL	STANDARDIZED RESIDUALS −2.0 0 2.0
1	.489	1.229	−.740491*	
2	1.179	1.297	−.117854	
3	1.751	1.364	.386990	
4	1.947	1.431	.515952	
5	1.468	1.499	−.030949	
6	1.629	1.566	.062979	
7	1.758	1.634	.124158	
8	1.949	1.701	.247626	
9	1.893	1.769	.124536	
10	1.726	1.836	−.109682	
11	1.690	1.903	−.213356	
12	1.721	1.971	−.249910	

DURBIN-WATSON TEST = .8936

During 1983, private edible oil processors purchased almost all of their imported edible oils through the GCP at the subsidized domestic procurement price. As import prices begin to fall below the domestic procurement price, private processors will again seek to buy cheaper imported oil outside the GCP's importing channels.

If the government decides to enforce the domestic procurement price as a protective price barrier, it will tend to stabilize domestic production incentives and remove a major source of price uncertainty for edible oil refiners. An import price floor would eliminate all risk for border prices below the floor (the importer would pay the difference between the import price and the floor price as a tariff), but allow oil refiners to assume new risks in exchange for potentially cheaper domestic oil. Oil processors and farmers could reduce wholesale oil price risk through forward contracting. As import prices rose above the import floor price, oil processors would have even greater incentives to divert risk in the import market to the domestic market.

ANNEX F

SELECTED REFERENCE DATA ON MAJOR COMMODITY EXCHANGES

CHICAGO BOARD OF TRADE

Commodity Limit	Trading Months	Trading hours (local time)	Contract Size	Minimum	Daily Price
Corn	Mar/May/July	9:30–1:15	5,000 bu.	1/4¢/bu. =$12.50	10¢/bu. =$500
Soybeans	Jan/Mar/May/July Aug/Sept/Nov	9:30–1:15	5,000 bu.	1/4/bu. =$12.50	30¢/bu. =$1,500
Soybean Meal	Jan/Mar/May/July Aug/Sept/Oct/Dec	9:30–1:15	100 tons	10¢/ton =$10	$10/ton =$1,000
Soybean Oil	Jan/Mar/May/July Aug/Sept/Oct/Dec	9:30–1:15	60,000 lb.	1/100¢/lb =$6	1¢/lb. =$600
Wheat	Mar/May/July Sept/Dec	9:30–1:15	5,000 bu.	1/4¢/bu. =$12.50	20¢/bu. =$1,000

CHICAGO RICE AND COTTON EXCHANGE

(Formerly New Orleans Commodity Exchange, now trades on floor of Mid America Commodity Exchange)

Rough Rice	Jan/Mar/May July/Sept/Nov	8:45–1:45	2,000 cwt. (200,000 lb.)	1¢/cwt. =$20	30¢/cwt. =$600

KANSAS CITY BOARD OF TRADE

Wheat (hard red winter)	Mar/May/July Sept/Dec	9:30–1:15	5,000 bu.	1/4¢/bu. =$12.50	25¢/bu. =$1,250

MID AMERCA COMMODITY EXCHANGE

Corn	Mar/May/July Sept/Dec	9:30–1:30	1,000 bu.	1/8¢/bu. =$1.25	10¢/bu. =$100
Oats	Mar/May/July Sept/Dec	9:30–1:30	1,000 bu.	1/8¢/bu. =$10	6¢/bu. =$60
Soybeans	Jan/Mar/May July/Aug/Sept/Nov	9:30–1:30	1,000 bu.	1/8¢/bu. =$1.25	30¢/bu. =$300
Wheat	Mar/May/July Sept/Dec	9:30–1:30	1,000 bu.	1/8¢/bu =$1.25	20¢/bu. =$200

MINNEAPOLIS GRAIN EXCHANGE

Spring Wheat	Mar/May/July Sept/Dec	9:30–1:15	5,000 bu	1/8¢/bu. =$6.25	20¢/bu. =$1,000
Sunflower Seeds	Jan/Mar/May July/Nov	9.25–1:20	100,000 lb.	1/100¢/lb =$10	1/2¢/lb. =$500

LONDON VEGETABLE OIL TERMINAL MARKET ASSOCIATION LTD

Commodity	Trading Months	Contract Size	Minimum Price fluctuation	Trading hours (local time)
Soybean Oil	Feb/Apr/June Aug/Oct/Dec	25 metric tons	$0.50/ton	Kerb calls: 10:15, 12:15, 2:30, 3:00

THE GAFTA SOYABEAN MEAL FUTURES ASSOCIATION LTD

Soybean Meal	Feb/Apr/June/Aug Oct/Dec/Feb	100 metric tons	10 pence/ton	10:30–12:00 2:45–4:45

HONG KONG COMMODITY EXCHANGE LTD.

Soybeans	Six consecutive months ahead	66,000 lb.	HK 20¢/bag HK $100	9.50–10:50, 12:50–2:50

THE KUALA LUMPUR COMMODITY EXCHANGE

Palm Oil	Next six months plus alternate months thereafter	25 metric tons	Malaysian $1/ton =M $25	10:00–12:30 3:30–6:00

ADDRESSES OF SELECTED EXCHANGES

1. Minneapolis Grain Exchange
   150 Grain Exchange Building
   Minneapolis, MN 55415
   (612) 338–6212

2. New York Cotton Exchange
   4 World Trade Center
   New York, NY 10048
   (212) 938–2702
   (212) 938–2676

3. London Vegetable Oil
   Terminal Market Association Ltd.
   Cereal House
   58 Mark Lane
   London, England
   EC 3R 7NE
   Phone: 01 481 2080
   Telex 884370

4. The GAFTA Soya Bean Meal
   Futures Association Ltd.
   Cereal House
   58 Mark Lane
   London, England
   EC 3R 7NE
   Phone: 01 481 2080
   Telex 884370

5. The Hong Kong Futures Exchange Ltd.
   Hutchison House, Second Floor
   Harcourt Road
   Hong Kong
   5–251005

6. Kuala Lumpur Commodities Exchange
   Lot. 3.78, Third Floor
   Wisma Stephens
   Jalan Raja Chulan
   Kuala Lumpur, Malaysia
   Phone: 413411 and 413559

7.. Chicago Board of Trade
   LaSalle at Jackson
   Chicago, IL 60604
   Phone: 1–800–621–4641

ANNEX G

GCP REGISTRATION OF IMPORTED EDIBLE OIL SUPPLIERS

TABLE G-1. LIST OF CURRENT RBD PALM OIL SUPPLIERS REGISTERED WITH GCP

	NAME OF SUPPLIER	NAME OF KARACHI AGENT
1.	Al-Futtaim Industries, Dubai	Naseer & Co.
2.	Algul Pte., Ltd., Singapore	HMB & Sons, Limited
3.	Ballarpur Palm Oil, Kuala Lumpur	Allied Corporation
4.	Chia Nephews, Singapore	United Arab & Pakistan Maritime, Ltd.
5.	Continental Grains Co., New York	Hassan Ali & Co.
6.	Decollete, Ltd., Hong Kong	Aim Enterprises, Ltd.
7.	Edible Oil Products, Malaysia	Tiger Trading Co.
8.	Ganda Edible Oil, BHD, Kuala Lumpur	Adil Bros.
9.	Geeta Oil Industries, Penang	Global Commodities, Ltd.
10.	General Oil Refining, Malaysia	Progressive Corporation
11.	Guan Soon Heng Edible Oil, Taiping, Malaysia	Sunflower Enterprises
12.	Horozon Services, Singapore	Allied Corporation
13.	Inerbras, New York	Arfeen International
14.	Interice, Ltd., London	International Business, Ltd.
15.	Intraco, Singapore	Al-Akbar International, Ltd.
16.	Jomalina, Kuala Lumpur	Aim Enterprises, Ltd.
17.	Kampas Edible Oil, Malaysia	Tajjarul Bahar
18.	Keck Seng, Johre Bahru, Malaysia	United Arab & Pakistan Maritime, Ltd.
19.	Kupak Sdn. Bhd., Kuala Lumpur	Global Commodities, Ltd.
20.	Lamsoon Oil & Soap Mfg., Singapore	Progressive Corporation
21.	Lee Oil Mills, Kuala Lumpur	United Arab & Pakistan Maritime, Ltd,
22.	Malaysia Vegetable Oil Refinery, Kuala Lumpur	Allied Corporation
23.	Malaysian Overseas Invest. Corp, Sdn. Bhd., Kelangor	Nara International, Lahore
24.	Malcolm Maclaine, Ltd., London	Alam & Alam
25.	Maniala Bolding, Penang	Trading Enterprises, Ltd.
26.	Marpro, London	Trading Enterprises, Ltd.
27.	Maruiani Corp., Tokyo	Maruiani Liaison Office
28.	Matthas & Porton, Sdn. Bhd., Kuala Lumpur	Saritow, Ltd.
29.	Mitsubishi Corp., Tokyo	Ahmad Jaffer & Co., Ltd.
30.	Mitsui & Co., Ltd., Karachi	Mitsui Liaison Office
31.	Nalin Industries, Kuala Lumpur	Pioneer International Mercantile Agency
32.	Nissho–Iwai, Tokyo	Sarfaraz, Ltd.
33.	Palmex Industries, Penang	Haji Ahmed Bros., Ltd.
34.	Pan Century, Kuala Lumpur	Farooq Cotton Mills
35.	Pasternak Baum, New York	Universal Commodities, Ltd.
36.	Patel Holding Pte., Ltd., Singapore	Haji Ahmed Bros., Ltd.
37.	Rafina Oil Products, Kuala Lumpur	United Arab & Pakistan Maritime, Ltd.
38.	Razik Fareed International, Kuala Lumpur	Dawn Corp.
39.	Saudi Sabah Palm Oil, Malaysia	Beene Pakistan, Ltd.
40.	Socoil, Kuala Lumpur	Al-Akbar International, Ltd.
41.	Soctek, Kuala Lumpur	Al-Akbar International, Ltd.
42.	Southern Edible Oil, Malaysia	Universal Commodities, Ltd.
43.	Tech Trade Pte., Ltd., Singapore	Pioneer International Mercantile Agencies
44.	Unifood, S. A., Geneva	Haji Ahmad Bros., Ltd.

SUPPLIERS SORTED BY LOCAL AGENTS

	NAME OF KARACHI AGENT	NAME OF SUPPLIER
1.	Adil Bros.	Ganda Edible Oil, BHD., Kuala Lumpur
2.	Ahmad Jaffar & Co., Ltd.	Mitsubishi Corp., Tokyo
3.	Aim Enterprises, Ltd.	Decollete, Ltd., Hong Kong
	Aim Enterprises, Ltd.	Jomalina, Kuala Lumpur
4.	Al-Akbar International, Ltd.	Intraco, Singapore
	Al-Akbar International, Ltd.	Socoil, Kuala Lumpur
	Al-Akbar International, Ltd.	Soctek, Kuala Lumpur
5.	Alam & Alam	Malcolm Maclaine, Ltd., London
6.	Allied Corporation	Ballarpur Palm Oil, Kuala Lumpur
	Allied Corporation	Horozon Services, Singapore
	Allied Corporation	Malaysia Vegetable Oil Refinery, Kuala Lumpur
7.	Arfeen International	Inerbras, New York
8.	Beene Pakistan, Ltd.	Saudi Sabah Palm Oil, Malaysia
9.	Dawn Corp.	Razik Fareed International, Kuala Lumpur
10.	Farooq Cotton Mills	Pan Century, Kuala Lumpur
11.	Global Commodities, Ltd.	Geeta Oil Industries, Penang
	Global Commodities, Ltd.	Kupak Sdn. Bhd., Kuala Lumpur
12.	Haji Ahmad Bros., Ltd.	Unifood, S. A., Geneva
	Haji Ahmad Bros., Ltd.	Palmex Industries, Penang
	Haji Ahmad Bros., Ltd.	Patel Holding Pte., Ltd., Singapore
13.	Hasan Ali & Co.	Continental Grains Co., New York
14.	HMB & Sons, Limited	Algul Pte., Ltd., Singapore
15.	International Business, Ltd.	Interice, Ltd., London
16.	Mauiani Liaison Office	Maruiani Corp., Tokyo
17.	Mitsui Liasion Office	Mitsui & Co., Ltd., Karachi
18.	Nara International, Lahore	Malaysian Overseas Invest. Corp, Sdn. Bhd., Kelangor
19.	Naseer & Co.	Al-Futtaim Industries, Dubai
20.	Pioneer International Mercantile Agencies	Tech Trade Pte., Ltd., Singapore
	Poineer International Mercantile Agency	Nalin Industries, Kuala Lumpur
21.	Progressive Corporation	General Oil Refining, Malaysia
	Progressive Corporation	Lamsoon Oil & Soap Mfg., Singapore
22.	Sarfaraz, Ltd.	Nissho-Iwai, Toyko
23.	Saritow, Ltd.	Matthas & Porton, Sdn. Bhd., Kuala Lumpur
24.	Sunflower Enterprises	Guan Soon Heng Edible Oil, Taiping, Malaysia
25.	Tajjarul Bahar	Kampas Edible Oil, Malaysia
26.	Tiger Trading Co.	Edible Oil Products, Malaysia
27.	Trading Enterprises, Ltd.	Maniala Bolding, Penang
	Trading Enterprises, Ltd.	Marpro, London
28.	United Arab & Pakistan Maritime, Ltd.	Chia Nephews, Singapore
	United Arab & Pakistan Maritime, Ltd.	Keck Seng, Johore Bahru, Malaysia
	United Arab & Pakistan Maritime, Ltd.	Lee Oil Mills, Kuala Lumpur
	United Arab & Pakistan Maritime, Ltd.	Rafina Oil Products, Kuala Lumpur
29.	Universal Commodities, Ltd.	Pasternak Baum, New York
	Universal Commodities, Ltd.	Southern Edible Oil, Malaysia

Source: GCP Edible Oil Import and Logistics Div.

Note: The registration of Compagnie Noga, Geneva, has been suspended.

TABLE G-2. LIST OF CURRENT SOYBEAN OIL SUPPLIERS REGISTERED WITH GCP

	NAME OF SUPPLIER	NAME OF KARACHI AGENT
1.	Balfour, New York	Hassan Ali & Co.
2.	Boles & Co., Inc., California	Mushtaq A. Siddiqui
3.	Cargill, New York	Alam & Alam
4.	Continental Grains Co., New York	Hassan Ali & Co.
5.	Corposol, S.A.,Geneva	Al-Akbar International, Ltd.
6.	Interaras, New York	Arfeen Internationai
7.	Lewis & Peat Agri-Produce Inc., New York	Hakimuddin Hormarje & Sons
8.	Louis Dreyfus, Stamford, Conn., USA	Trans Ocean Asia
9.	Marubeni Corporation, for USA	Marubini Liaicon Office
10.	Mitsubishi Corp., Tokyo	Mitsubishi Liaison Office
11.	Mitsui Karachi, for USA	Mitsui Liaison Office
12.	N.V Bunge, New York	Bunge Liaison Office
13.	Nissho-Iwai, Tokyo, for USA	Sarfaraz, Ltd.
14.	Pasternak Baum, New York	Universal Commodities, Ltd.
15.	Richco Grain, Ltd., New York	Haji Ahmed Bros., Ltd.
16.	Socomet, New York	Universal Commodities, Ltd.
17.	Sumitomo Corp, New York	Sumitomo Liaison Office
18.	Woodward Dickerson, USA	C.I.C., Ltd.

	NAME OF KARACHI AGENT	NAME OF SUPPLIER
1.	Al-Akbar International, Ltd.	Corposol, S.A., Geneva
2.	Alam & Alam	Cargill, New York
3.	Arfeen Internationai	Interarars, New York
4.	Bunge Liaison Office	N.V. Bunge, New York
5.	C.I.C., Ltd.	Woodward Dickerson, USA
6.	Haji Ahmed Bros., Ltd.	Richco Grain, Ltd., New York
7.	Hakimuddin Hormarje & Sons	Lewis & Peat Agri-Produce Inc., New York
8.	Hassan Ali & Co.	Balfour, New York
	Hassan Ali & Co.	Continental Grains Co., New York
9.	Marubini Liaison Office	Marubeni Corporation, for USA
10.	Mitsubishi Liaison Office	Mitsubishi Corp., Tokyo
11.	Mitsui Liaison Office	Mitsui Karachi, for USA
12.	Mushtaq A. Siddiqui	Boles & Co., Inc., California
13.	Sarfaraz, Ltd.	Nissho-Iwai, Tokyo, for USA
14.	Sumitomo Liaison Office	Sumitomo Corp. New York
15.	Trans Ocean Asia	Louis Dreyfus, Stamford, Conn., USA
16.	Universal Commodities, Ltd.	Pasternak Baum, New York
	Universal Commodities, Ltd.	Socomet, New York

Source: : GCP Edible Oil Import and Logistics Div.

Note: : The registration of Beacham Commodities, New York, has been suspended.

ANNEX H

SOYBEAN OIL FUTURES PRICE DATA

TABLE H-10. U.S. DAILY SOYBEAN OIL FUTURES PRICE DATA JANUARY-MAY, 1984

			CONTRACT OPTIONS			BASIS		
MONTH	DAY	CASH	JAN OPT	MAR OPT	MAY OPT	JAN OPT	MAR OPT	MAY OPT
		Cents per Pound						
JAN	6	28.24	27.99	28.53		0.25	−0.29	
	9	28.43	28.13	28.73		0.25	−0.30	
	10	29.29	28.99	29.51		0.30	−0.22	
	11	30.10	29.80	30.08		0.30	0.02	
	12	29.85	29.55	29.97		0.30	−0.12	
	18	27.15	26.95	27.33		0.20	−0.18	
	19	27.67	27.23	27.57		0.44	0.10	
	20	27.55	27.35	27.47		0.20	0.08	
	23	27.75		27.55	28.10		0.20	−0.35
	25	28.19		27.99	28.57		0.20	−0.38
	30	27.31		26.96	27.57		0.35	−0.26
FEB	3	27.93		27.58	28.17		0.35	−0.24
	6	27.63		27.28	27.98		0.35	−0.35
	8	27.34		26.99	27.73		0.35	−0.39
	10	26.34		25.94	26.66		0.40	−0.32
	13	25.75		25.07	25.69		0.68	0.06
	14	25.16		24.76	25.38		0.40	−0.22
	16	25.80		25.40	25.71		0.40	0.09
	21	26.90		26.30	26.49		0.60	0.41
	22	27.90		27.30	27.49		0.60	0.41
	23	28.87		28.27	28.22		0.60	0.65
	28	27.65		27.08	27.34		0.57	0.31
MAR	1	28.38		27.78	28.10		0.60	0.28
	6	29.20		28.55	28.90		0.65	0.30
	8	29.03		28.38	28.78		0.65	0.25
	12	30.00		29.35	29.58		0.65	0.42
	15	30.17		29.39	29.57		0.78	0.60
	16	30.37		29.78	29.77		0.59	0.60
	19	30.37		29.63	29.77		0.74	0.60
	21	31.65		30.98	31.05		0.67	0.60
	23	31.45			30.85			0.60
	26	31.08			30.48			0.60
	29	30.33			29.73			0.60
APR	2	30.93			30.33			0.60
	5	31.77			31.17			0.60
	9	31.55			30.95			0.60
	12	30.73			30.08			0.65
	16	31.26			30.92			0.70
	18	31.90			31.20			0.70
	24	33.37			32.67			0.70
	26	32.68			31.98			0.70
	27	33.55			32.70			0.85

ANNEX H (Continued)

MONTH	DAY	CASH	CONTRACT OPTIONS			BASIS		
			JAN OPT	MAR OPT	MAY OPT	JAN OPT	MAR OPT	MAY OPT
			Cents per Pound					
MAY	1	33.92			33.02			0.90
	3	35.05			34.15			0.90
	4	35.43			34.53			0.90
	7	36.13			35.13			1.00
	9	37.53			36.53			1.00
	10	38.17			36.87			1.30
	14	40.35			38.85			1.50
	17	41.45			39.95			1.50
	21	41.12			39.87			1.25
	24	40.85						
	29	39.28						

Source: Asian Wall Street Journal, various issues.

ANNEX I

LIST OF PERSONS INTERVIEWED

GOP OFFICIALS

Islamabad

1. G. K. Dhakan, Joint Secretary
   Ministry of Industries

2. Rahtullah Khan, Additional Secretary
   Ministry of Industries

3. Khawaja Javed Sarshad, Deputy Secretary
   Ministry of Industries

4. Sahibzada Mohammad Ayaz
   Chief, Agriculture Section
   Ministry of Planning and Development

5. Tahawar Ahmed,
   Section Chief, Economic Affairs Division
   Ministry of Finance

6. Dr. Arshad Zaman
   Economic Advisor
   Ministry of Finance

7. Dr. Kamal Abdur Rehman
   Joint Economic Advisor
   Ministry of Finance

Lahore

8. Aslam Iqbal,
   Chairman
   Ghee Corporation of Pakistan Limited

9. Dr. Nasir Saeed Butt,
   General Manager (Tech. & Opns.)
   Ghee Corporation of Pakistan Limited

10. Mohammad Amin,
    General Manager (Seed Division)
    Ghee Corporation of Pakistan Limited

Karachi

11. S. K. Imam,
    General Manager (Oil Imports & Logistics Div)
    Ghee Corporation of Pakistan Limited

12. M. M. Alam,
    Manager (Oil Imports)
    Ghee Corporation of Pakistan Limited

PRIVATE SECTOR OFFICIALS

Karachi

13. Haroonur Rashid,
    Senior Vice President
    Chamber of Commerce and Industry

USG OFFICIALS

14. William L. Brant,
    Agricultural Attache
    U. S. Embassy, Islamabad

15. William T. White, Jr.,
    Regional Affairs Officer
    USAID, Karachi