Competitiveness and Marketability of Vegetable Oils, Oilmeals, and Plant Equipment for Processing of Oilseeds and Oils in the Baltic States

Sanjeev Agarwal and John Wong

MA TRIC Working Paper 96-MWP 1
August 1996

Midwest Agribusiness Trade Research and Information Center
Iowa State University
Ames, IA 50011

Sanjeev Agarwal and John Wong are associate professors of marketing, College of Business, Iowa State University

This report summarizes a MA TRICfunded research project examining competitiveness and marketability issues in ***the oilseed industries of Lithuania, Latvia, and Estonia.***

MATRIC is ***supported by the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture, under Agreement*** *No. 95-34285-1303.* ***Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the*** *view of the U.S. Department of Agriculture.*

CONTENTS

FIGURES

TABLES

ACKNOWLEDGMENTS

This project assesses the competitiveness and marketability of vegetable oils, oilmeals, and evaluates plants and processing equipment used for oilseeds in Estonia, Latvia, and Lithuania. The midwestern states are major processors of oilseeds and also major suppliers of equipment for processing of oilseeds and oils (including handling and storage, oil extraction, oil refining, value added processing, meal handling and storage, pelletizing, extruding, and protein extraction). With many of these companies poised to benefit from a better understanding of the marketing and investment opportunities ¡n the Baltic States, it is important that a comprehensive technological and market study be conducted to help companies develop an action plan.

Our study included a search of secondary publications, analysis of information supplied by oil processing equipment suppliers, and conducting a field study that included interviews with government, farm, and industry representatives as well as visits to producers and processing plants in the three Baltic States in June and July 1994.

We want to extend our special thanks to Dr. George Uldis Liepa, Professor, Department of Nutrition and Food Sciences, Texas Women's University, Denton, for accompanying Dr. Agarwal on a field trip to the Baltics. Without his invaluable cooperation, enthusiasm, and local networking, this research would have been difficult. We also want to thank Dr. Olafs Stengrevics, Director, BBL Ltd., Riga, a friend of Dr. Liepa, for arranging meetings with government, farm, and industry representatives. He not only arranged meetings for us, but visited with us whenever we needed his moral and intellectual support. His cheerful and enthusiastic disposition helped us get through some challenging times.

We must mention that many other people helped clear hurdles in arranging meetings with relevant officials and businesspersons. Especially notable are Dr. Natalija Kazlauskiene, Unit Head, International Trade Development, Ministry of Agriculture, Republic of Lithuania, for arranging meetings for us in Lithuania and Mr. Ruve Sank, Vice Chancellor, Ministry of Agriculture, Republic of Estonia, for arranging meetings for us in Estonia. The project would not have been completed without the input of all those whom we interviewed and who provided invaluable information to us. We are also thankful to Honorable Mr. Olgerts Pavlovskis, State Minister for EU Affairs and Foreign Trade, Ministry of Foreign Affairs, Republic of Latvia. He enthusiastically endorsed our belief that the Baltic states need several

)rivately owned, small-scale oilseed and oil processing plants. We are extremely encouraged by h support and the support of many others whose ideas are imbedded in this report.

Finally, we would like to extend our special thanks to Dr. William H. Meyers, Director of MATRIC, Iowa State University, for sponsoring this project and providing us with support. We also thank Kate Pokorny and Lori Dooley for their assistance with this project.

-Sanjeev Agarwal and John Wong

COMPETITIVENESS AND MARKETABILITY OF VEGETABLE OILS, OILMEALS, AND PLANT EQUIPMENT FOR PROCESSING OF OILSEEDS AND OILS IN THE BALTIC STATES

Introduction

The Baltic States of Estonia, Latvia, and Lithuania (see Figure 1), formerly part of the Soviet Union, have a rich tradition in agriculture. Besides agriculture, these countries have also been at the forefront of processing, manufacturing, and research and development activities within the former Soviet Union. However, after the collapse of the Soviet Union and eventual severing of the political and economic alliance with Russia, the three countries found themselves in a difficult situation. The problems arose from their previous high degree of integration with, and dependence on, Russia.

Both agriculture and industrial sectors in the Baltics were planned and established by the former Soviets as links in long manufacturing and supply chains spanning the Soviet land. The sourcing of capital, raw materials, components, and machineries and eventual transportation, utilization, and consumption of outputs was planned by the bureaucratic machinery based in Moscow. With the collapse of the Soviet system and eventually the Russian economy, both farm and manufacturing operations in the Baltic States lost their upstream sourcing as well as downstream supply/distribution links. This forced many farm and industrial operators to go out of business. Only those operators that used local raw materials and whose outputs were primarily consumed locally, such as dairies, confectioneries, breweries, meat processors, and some canneries, survived. Consequently, the successful farm operators were those who produced agricultural products that supported these manufacturing operations.

For Estonia, Latvia, and Lithuania, the problems created by the severance of the alliance with Russia have been intensified due to the transition towards a market economy. Agricultural subsidies have been scrapped and competition from the West permitted since these are essential preconditions for transition to an efficient and competitive, market-oriented agricultural sector. Though price liberalizations have increased prices sharply, including retail and farm procurement prices, procurement prices have not risen enough to encourage farming operations.

Moreover, Western goods have flooded the markets. The immediate effect of these open door policies has been that consumers have dumped the shoddy Russian style consumer products in favor of quality Western products. The agricultural sector has been similarly set back because Western produce is now available in the Baltics at lower prices than those for domestic produce. Partly because of heavy

European Union subsidies and partly because of lower processing costs, better quality products from the West are available in the Baltics at prices that are well below the prices of locally produced products.

Trade policy has attempted to protect the fragile state of the domestic agriculture sectors from (often subsidized) imports and tried to promote production to meet domestic demand. In Latvia, for example, import duties of 7.5 percent were introduced in 1992 on many products, including sugar, vegetable oil, and grain products.' The problem, however, is that the size of the domestic market is so small that it makes it difficult to justify establishing large-scale production/manufacturing operations. Additionally, the small potential market that there is, is already serviced by Western products, even though their import is subject in many cases to restrictions or tariffs.

The drop in domestic demand for locally made products, together with high input prices and a slump in export demand, has created an extremely difficult market situation. Both agricultural and industrial sectors are deeply in debt and illiquid. Large-scale financial collapse of state and collective farms has given way to subsistence farming in the private sector. Likewise, the collapse of many state-owned factories and cooperatives has given way to entrepreneurs who lease parts of factories and conduct private business. While these kinds of activities show signs of budding private enterprise, the immediate outlook does not appear to be encouraging. This can be largely attributed to the lack of capital among farmers and entrepreneurs. Capital is available from private banks and can be borrowed. However, astronomically high interest rates have made it difficult to establish business, especially those that can legitimately compete with those in the West.

The farmers, as a consequence, are very pessimistic and reluctant to borrow funds to cultivate crops and raise livestock that will eventually compete with products from the West. Both governments and consumers recognize that agriculture can no longer be viewed as a sector from which it is possible to earn hard currency export income or to even save hard currency through import substitution.

In spite of this difficult past, it is important for farmers, entrepreneurs, and governments to identify and evaluate crops that can be profitable and can be cultivated and converted into value-added products for consumers and industry. One crop that is highly valued is rapeseed. Demand for rapeseed is growing worldwide; Western European countries are consuming more than they can produce. Therefore, the danger of being flooded with cheap Western rapeseed is minimal.

Oil can be extracted from rapeseed and refined for human consumption in local processing plants. The benefit of seed processing plants is that the three countries can capture the rapeseed crop and

produce highly desirable vegetable oil for human and nonhuman consumption. The by-product is another important product, oilmeal-a high protein source-for animal feed.

Consumers are moving away from using animal fat and butter because of harmful health effects? Vegetable oil is therefore a preferred product. Currently, completely refined vegetable oil is not produced in any of the three countries. Refined oil is being imported for consumers as well as for downstream processing of mayonnaise, margarine, soap, and similar products. Protein for animal feed is important to sustain the dairy and livestock industry. Currently, there is a serious shortage of protein additives in each of the three countries, so they are being imported from the West. In some cases, farmers are feeding raw seed to the cattle as protein supplements. This is highly inefficient use of the seeds because, in addition to the protein, large quantities of high-value oil are being fed to the animals. Moreover, a large amount of oil is not good for the animals.

Rapeseed

A number of farmers have expressed a willingness to grow rapeseed.' Only if the farmers are assured that there is a market for their seeds locally, will they be encouraged to cultivate the crop. At present, rapeseed cultivation is negligible. However, there is substantial potential for it to grow but cultivation and processing must be coordinated correctly and cooperatively.

The Baltic States need to encourage private or cooperative establishment of small-scale rapeseed (both seed and oil) processing plants at various growing centers throughout the three countries. This will revive the cultivation of a cash crop that can enhance the well-being of the farmers and the consumers. As the crop output increases, the processing plants can be expanded to process more rapeseed.

Rapeseed oil is low in erucic acid and glucosinolates, elements that present potential health risks to humans and reduce the palatability and nutritional value as feed." Because of the implied health benefits associated with the lowest saturated-fat content among all major vegetable oils, rapeseed has become a major source of vegetable oil worldwide.

The demand for rapeseed, like any other vegetable oil source, is derived from its value as an input in oil and oilmeal. Rapeseed contains roughly 40 percent oil, which typically accounts for 60 to 70 percent of the overall seed value. The oil is suitable for use in salads and cooking oils and baking and frying fats. Farther along the marketing channel, rapeseed oil reaches consumers in processed foods such as potato chips, salad dressings, mayonnaise, baked goods, and candies.

Another component of rapeseed demand is oilmeal. Demand for oilmeal is driven by the demand for balanced feed concentrates, which depend upon the size and composition of the livestock herd. In this market, the rapeseed meal competes with soybean, cottonseed, linseed, and sunflower-seed meals. Rapeseed meal accounts for 55 to 57 percent of the seed weight in contrast to other oilseeds, such as soybean and cottonseed, that contain in excess of 80 percent meal. Crude protein in rapeseed generally ranges between 35 and 38 percent, significantly lower than soybean meal, which contains 44 to 49 percent crude protein. With a smaller market potential and lower feeding value, rapeseed meal is typically discounted to soybean meal. In recent years, the relationship between soybean meal and rapeseed meal has remained relatively constant. Though the price of rapeseed meal is an average of 35 percent below the price of soybean meal, it still costs about US$150 per ton.'

Cultivation of Rapeseed

The World

Worldwide production of all rapeseed has risen rapidly over the past two decades and now ranks third in world oilseed cultivation (Table 1). Rapeseed is one of the few edible oil crops that can be cultivated in northern latitudes. In most northerly growing locations such as Canada, rapeseed is grown as a spring crop but in other areas, such as Western Europe, it is largely a winter-planted crop that is higher yielding. Yields in Europe and Poland are much higher than in other parts of the world (2.73 tons per hectare [tph] in Europe and 2.47 tph in Poland).

The Region

The former Soviet Union (USSR) produced only a fraction of the world's rapeseed output. In recent years, Soviet output averaged about 55,000 tons of rapeseed per year. In contrast, the USSR's neighbor to the South, China, produced 5.6 million tons in 1985, and Czechoslovakia, Poland, the German Democratic Republic, and Yugoslavia all outproduced the USSR. This situation irritated Soviet agricultural officials, who publicly chided Baltic and Belorussian farmers for producing a paltry 2,500 tons of rapeseed while their Polish neighbors produced 1.1 million tons [6]

The Baltics

Estonia. Mr. Toomas Kevvai,' with the Ministry of Agriculture, indicated that there were 2,600 hectares of rapeseed cultivated in 1992. The yield was 0.8 tph, the lowest of all three republics. Growing and harvesting technology in the Baltics is substandard and results in lower yields'

The government estimates that up to 30,000 hectares of rapeseed could be planted and the entire oil requirement for the country can be supplied with this seed output. In addition, up to 50 percent of the oil meal requirement can be grown domestically. Currently, however, only fragmented cultivation of rapeseed is seen throughout Estonia.

Latvia. Free Latvia experimented with rapeseed by planting an estimated 3,000 hectares in 1993' The total output was about 4,500 tons, which translates to a yield of 1.5 tph. The farmers are very reluctant to increase rapeseed cultivation because there is no local demand for it. In the past, they have had considerable losses because the product had to be sold to the West at discounted prices. Part of the problem was that they did not have appropriate technology for drying and maintaining the quality of the seeds.

Privately, Canadian Agra" has a joint venture farm on 1,500 hectares in southern Latvia. Canadian Agra buys the seeds from the West and sells to farmers and consults on planting. The output from these farms has been sold to Denmark at about US$200 per ton plus transportation. The firm is interested in increasing the land under cultivation but finds itself constrained by lack of downstream processing facilities in the country.

Lithuania. Free Lithuania did a little better and produced 8,000 metric tons of rapeseed in 1993. Because of the lack of seed processing facilities, 4,000 tons of the seeds were exported to Denmark. According to Mr. Rimas Varkulevichius'2, the Director of the Department of International Relations, Ministry of Agriculture, Republic of Lithuania, 6,000 hectares were planted in winter 1994. Unfriendly weather, however, destroyed 80 percent of the crop. In the summer of 1994, 10,000 hectares were planted and he expected the yield to be about 20,000 tons (or about 2.0 tph). Lithuania's rapeseed yield of about 2.0 tph is good compared with 2.47 in Poland, 2.73 in EC and 1.21 in Canada." According to Mr. Varkulevichius, the plans are to eventually raise the seed output to 140,000 metric tons. The government of Lithuania is providing some financial assistance and crop protection to farmers.

Production of Rapeseed Oil

The World

Rapeseed is a major source of vegetable oil worldwide. Rapeseed oil is the third most produced oil in the world, just behind soybean and palm oil. Total oil production in 1991/92 was 63.117 million tons, of which rapeseed oil was 9.505 million tons. The world production of major vegetable oils by country is shown in Table 2.

The Region

The main sources of vegetable oil in Russia and the former Soviet republics are sunflower seed and cottonseed. Rapeseed production has increased in Poland. The rapeseed output in Poland is about 1,200,000 tons, which means that rapeseed oil output is between 400,000 and 500,000 tons per year.

The Baltics

Estonia. According to Mr. Toomas Kevvai, a counselor with the Ministry of Agriculture, Estonia has three cooperatives/unions that extract/expel oil from rapeseeds. Only one of them, Oruraps, Ltd., in Hari county, is operative. The plant capacity is 2,500 tons of seeds per year but it may be only processing about 1,000 tons per year at the present time. In 1992, the three producers formed a Rapeseed Producers' Association (RPA) under the auspices of the Association of Estonian Food Industry (AEFI). According to Mr. Roland Ilp, the Chancellor of AEFI and the Director of RPA, Estonia had one margarine plant, the Tallinn Perfumery and Margarine Plant, that, at its peak, produced 6,000 tons of margarine per year. This plant is, however, not functioning any more. In its place is a brand new plant, supplied by a Swedish firm, Tetra Laval Food, formerly known as Alfa Laval. The plant has a capacity to refine/hydrogenate 15,000 tons of rapeseed oil per year and convert it into 22,000 tons of margarine.

The plant was one of ten plants purchased by the former Soviet government in 1989. Interestingly, only four of the ten plants have been installed." Others, including the one in Estonia, remain partially in boxes, unopened. Tetra Laval is not certain whether all parts for the plant arrived in Tallinn and what remains of it after five years." The Estonian government officials estimate that they have already spent US$6 million on this plant. Additional investment of US$15 million will be needed to complete the plant.[6] Various foreign firms, including Raizier from Finland, have considered the purchase of this plant, although no one purchased it until the summer of 1994.

The original Tallinn Perfumery and Margarine Plant has now been privatized. The current name of the company is Formeer Ltd. According to its director, Mr. Arvo Hiller, the portion of the old plant that is operative is a 5-tpd oil refinery. Margarine is no longer produced in this plant. Although a visit to this plant was not possible, it appears that the plant produces only partially refined oil, meaning that it does not bleach or deodorize the oil.

Human consumption of unrefined or partially refined oils is not unheard of, but these oils have impurities that are either harmful or offensive. Since fully refined oil is available from the West, it is unlikely that a majority of consumers are going to buy the locally produced unrefined or partially refined oil. An informal survey of housewives, conducted during the site visit, revealed that locally produced so-called "refined" oil (in some cases, it is simply filtered crude oil; in others, it may be neutralized) has sediments, is colored, and has a bad smell. Consumers did not mention that the unrefined oils can also contain high levels of fatty acids that can cause irritation to the throat. The refining process basically removes all of these impurities to produce colorless, odorless, and acidless product. Most of the consumers interviewed now purchased imported refined oil. The imported refined oil comes from many firms located in both Western and Eastern European countries.

The good news for Estonia is that the original Tallinn Perfumery and Margarine Plant is now owned and operated privately and Mr. Arvo Hiller, its director, wants the plant to complete refining capabilities and to double its capacity. Mr. Hiller is also negotiating the purchase of the Tetra Laval plant.

The main concern for the new Tetra Laval plant owner is that the plant requires raw oil as its input rather than the seed and hence cannot survive unless the raw oil is imported or seed crushing plants in the country can supply the needed quantity. Given the information on seed cultivation at the present time, it is highly unlikely that Estonia's local seed output will be large enough to support a plant of this size.

Latvia. The only mentionable plant in the entire Baltics to extract/expel oil is located in Liepaja, Latvia, on the eastern shore of the Baltic Sea. It was built in the 1880s by a Danish firm." At present 30-year old oilseed pressing and extracting equipment is in the 100-year-old structure. Plant capacity is 45,000 tons of rapeseed or soybean per year. Like most agricultural industry in Latvia, the Liepaja plant is also state owned and controlled by LEER, a state shareholding company of the Ministry of Agriculture." The plant is currently operating at one-fourth to one-third its full capacity.

The plant only has a partial refining facility, so the output is not fit for human consumption. A private company has leased the facility from Liepaja, and is partially refining the Liepaja oil on the grounds of the Liepaja plant but because the oil is not fully refined, the partially refined oil is sold to a

fish canning factory. The company has contacted Tetra Laval to supply it with additional equipment to make fully refined oil. Tetra Laval is hesitant at this point to supply equipment because the smallest capacity plant supplied by them is 40 tpd, whereas the plant probably needs only a 10 tpd deodorizer."

Many foreign companies, including equipment suppliers such as Desmet of Belgium, have inspected the facilities at Liepaja and considered the feasibility of purchasing and renovating it." However, no one has come forward to purchase it. Perhaps the main concern is that the plant is simply too old and too inefficient to be of much value. Mrs. Irana Anshevica," Senior Manager, LATA International Ltd., informed us that the American Soybean Association specialists who visited the plant have recommended "scrapping" the plant. There were some efforts, however, made by LEER in cooperation with the Canadian Agra to establish a 100 tpd oil refining plant. However, the financing for such a plant ran into difficulty because the international funding agencies declined to support the plan.

There are two mayonnaise production facilities, one called Lacplesis Agrofirma and the other called Balttur (on the premises of Riga Taukvail Kombinat). Both companies are said to be producing about 10 tons of mayonnaise per day. Lacplesis packs their mayonnaise in 250 gram glass bottles, [4] whereas, Balttur packs them in plastic pouches .[5] Balttur has 14 different flavors/types of mayonnaise that are sold throughout Latvia.

Lithuania. According to Mr. Rimas Varkulevichius, Lithuania has one seed crushing plant at Obeliei that can crush 100 tons of seed per day (or about 25,000 to 30,000 tons of seed per year). According to Mr. Zelvys, formerly the General Director of Grain Processing enterprise, the Obeliei plant is old and has no future .[16] There is also a small oil refinery (or better, oil-cleaning) plant in Vilnius. Just like the plants in Estonia and Latvia, this plant also produces partially refined oil. Such oil cannot be expected to compete with the type coming from the West. According to Mr. Varkulevichius, this plant was opened for privatization to foreign firms. Unilever, a Dutch conglomerate, was said to have shown some interest but its consultants, KPMG, recommended against the purchase.

Mr. Zelvys, through his private firm, Grudtarna,[2] is promoting the idea of constructing a plant to process 144,000 tons of rapeseed (or 100,000 tons of soybean) per year at Kretinga or Klaipeda. Subsequent evaluations seemed to favor Kretinga over Klaipeda or other possible sites because of the availability of an excess steam generation plant and a rail siding. The reasons against Klaipeda include lack of space in an already crowded port town. The oil output of this plant will be roughly 40,000 tons and the oilmeal output will be in the range of 100,000 tons per year. Approximately US$400,000 was

granted by the Canadian government to study the feasibility of this project. The project is estimated to cost $35 to $40 million and seems to have the approval of the Lithuanian government?9 The main interest of the Canadian government is to support Canadian companies expected to supply equipment to the oilseed plant. Canada is not interested in rapeseed exports for the plant from Canada."

The promoters, however, have had considerable difficulty in attracting private out-of-country investors and getting loans from funding agencies such as the World Bank and EBRD. The problem, in our opinion, is that while demand for oil and oilmeal of the magnitude of this plant's proposed output exists in Lithuania, there isn't enough rapeseed cultivated in the country to support this plant. The present Lithuanian rapeseed output is only 15,000 to 20,000 tons. Assuming that the entire cultivation is available for this plant, it still is only about one-tenth of the need of the proposed plant. If the plant is operated at less than full capacity, high operating costs will make the project unprofitable. Even though the proposed plant size is considered the smallest commercially viable size in the West, we do not think that such projects are feasible in Lithuania or even the other two countries without substantial imports of seeds/oils.

Demand for Rapeseed Oil

Vegetable oils are primarily used for human consumption, as an ingredient in food, as a vehicle for cooking, or as margarine and salad oil. Nonedible uses include industrial applications, especially in making soap, detergents, and cosmetics. Usually demand for oil is positively correlated with GDP growth rate but other factors, including changes in taste and competition with other fats, also play an important role. Table 3 shows the per head consumption of vegetable oil in various regions of the world.

The Region

There are regional differences in vegetable oil consumption. In Eastern Europe and Russia, the market is dominated by locally produced sun flowerseed oil, which typically accounts for 50 percent of consumption. Though Table 3 projected a per head consumption in the former USSR to be 13.7 kilograms in 1991/92, other sources doubt these figures. These figures are based on a straight growth of 2 percent per year, which is unlikely to have been realized during the early 1990s. There are no current figures available for the region but previous estimates based on more cautious calculations suggest that it may not be more than 14 kilogram/head."

The Baltics

The **pattern** of consumption in the Baltic States is changing due to the cutoff from the former USSR. Since local production of oils as well as oilseeds is negligible, it is open for adaptation. Reliance on sunflowerseed oil, which was widely available from Russia and Ukraine, is likely to decline at the expense of other oils. All of the refined oil consumed in the three countries is currently imported.

Estonia. According to Mr. Toomas Kevvai, Councilor with the Ministry of Agriculture, Republic of Estonia, per capita consumption of oil and margarine in Estonia was estimated at 9 kilograms in 1980. While exact figures are not available, it is estimated that the consumption may have actually fallen in the 1990s.

Latvia. According to Mr. Henrihs Nagla12, Department Manager, Crop Processing, Ministry of Agriculture, Republic of Latvia, the current consumption of oil and margarine is about 20,000 tons. He estimates that the consumption should be in the range of 30,000 tons or about 12 kg/person.

Lithuania. The per capita consumption of vegetable oil and margarine in Lithuania was 8 kilograms/year in 1989. This was a 33 percent improvement over the consumption of 6 kilograms/year in 1980. Total imports of oil and margarine were 19,000 and 18,000 metric tons in 1989.'3 According to Mr. Rimas Varkulevichius, the country needs between 30,000 and 40,000 tons of oil and margarine.

Table 4 contains information on the estimated consumption of oils and margarine in the three countries. The first column estimates the oil consumption on the basis of a per capita consumption of 8 kilograms/year, which seems to be roughly the case in all three countries at the present time. The second column estimates the consumption on the basis of a **per capita** consumption of 14 kilograms/year, the average for Eastern European countries. The officials in each of the three countries seem to be optimistic that the oil and margarine consumption should increase to the level of the other Eastern European countries. In estimating their current needs, they were all basing their projections on a per capita consumption of between 12 and 14 kilograms. The third column of Table 4 estimates the consumption on the basis of a per capita consumption of 22.5 kilograms/year, the average for Western European countries. The estimates based on Western Europe may be a little optimistic, but they may provide an indication of long-range potential.

Prices

The completely refined oil (from Western sources) is freely available to consumers in the markets of Estonia, Latvia, and Lithuania at a retail price of about $1.20 to $1.30 in 1-liter plastic bottles. ;°

Based on the various information collected, we found that the wholesale price of crude rapeseed oil is about $0.40 to $0.55 per liter. Neutralized oil (de-acidified) is priced at around $0.60 per liter and bleached oil is priced at around $0.70 to $0.75 per liter. The completely refined oil (imported) can be purchased at about $0.95 to $1.05 per liter."

Demand for Oilmeals

The World

Oilmeals are used primarily as protein supplements in animal feeds. Oilmeal demand is derived from demand for meat and other livestock products, the demand for which in turn reflects such factors as population growth, income, and taste. Measures of livestock population provide a convenient shortcut to estimating the impact of income, population growth and changes in taste on oilmeal consumption. Oilmeal consumption tends to be associated with the more intensive forms of livestock farming of, for example, pigs, poultry, some forms of fish, and dairy cows. World livestock population is included in Table 5. The oilmeal consumption by region is included in Table 6. The principal oilmeals used throughout the world include soybean, sunflowerseed, cottonseed, groundnut, and rapeseed (Table 7).

The Baltics

Estonia. Estonia's livestock industry is the smallest of all three countries. Most of the requirement for its livestock population was met with imported oilmeals. In particular, Estonia imported 20,000 tons of soymeal from the United States in 1991 and 1992 [16]

Latvia. As part of the Soviet Union in 1989, Latvia produced 1,500,000 tons of livestock and poultry feeds: 700,000 tons for swine, 300,000 tons for poultry, 300,000 tons for cattle, 150,000 tons for fish and 50,000 tons for others. Protein meal usage was 170,000 tons (11.3% of all feeds). In 1992, Latvia produced an estimated 900,000 tons of mixed feeds. Latvia used an estimated 40,000 tons of soybean meal. The remaining oilmeal requirement was filled by the Liepaja oilseed crushing plant.

Lithuania. As part of the Soviet Union, Lithuania produced 2.5 million tons of mixed feeds in Malyba's 20 grain and feed processing plants .38 It used 250,000 tons of soybean meal. In 1990, however, the plant produced only 900,000 tons of feed: 400,000 tons for swine, 350,000 tons for poultry, 150,000 tons for cattle, and 100,000 tons for fish. Feed production did not exceed 1 million tons in 1993 and 160,000 tons of corn meal and 21,585 tons of soymeal was imported in 1993. The surplus from the

previous year was 45,000 tons of soymeal. The requirement in 1994 was expected to be about 100,000 tons of oilmeal, based on protein meal usage of about 10 to 11 percent of total animal feed (including grains). This ratio is well below the ratio used in Western countries.

Based on the animal feed consumed by the swine population, we can estimate that the total feed of 400,000 tons required about 40,000 tons of oilmeal. Given that there are 1.9 million head of swine in Lithuania (Table 8), the protein consumption per pig head is calculated as 20.9 kilograms/head. This consumption rate is considerably smaller than for any Western country (see Table 9). Even the consumption rate in Eastern Europe is more than four times the consumption rate in Lithuania. The consumption of protein for cattle is even lower: 7.1 kilograms/head. If we add all protein requirements for cattle, swine, poultry, and fish, it is an understatement that there is a considerable shortage of oilmeal in Lithuania.

The governments are aware of the relatively low protein usage rates in the Baltic States and have identified improved protein feeding as a key to raising livestock productivity.

Strategies

There is no doubt that there is a significant demand for refined edible oil and oilmeal in the three Baltic countries. According to Table 4, the current consumption of edible oil is estimated at 12,800 tons for Estonia, 20,800 tons for Latvia, and 30,400 tons for Lithuania. Assuming that the consumption of vegetable oil parallels Eastern Europe, Estonia, Latvia, and Lithuania should consume 22,400, 36,400, and 53,200 tons of vegetable oil per year.

The potential for oilmeal is more difficult to estimate. Presently, consumption is approximately 50,000 tons in Estonia, 100,000 tons in Latvia, and 100,000 tons in Lithuania. However, it is clear that present consumption levels are extremely low. Consequently, if livestock farming has to be sustained, consumption levels have to rise significantly. An increase of approximately four times in the. consumption of oilmeals may bring these three countries to the same level as Eastern Europe. Even then, they will be one-half to one-third of that in the developed West.

Considering this situation, it is clear that these three countries need seed and oil processing plants to not only supply oil but oilmeal as well. In addition, it will also invigorate farming activity that is currently well below reasonable levels.

There is some evidence, especially in Lithuania, that there is a government-backed attempt to establish one large plant, not large by Western standards, but large enough to meet the national

requirements. Another example is the Tetra Laval margarine plant that is yet to be commissioned in Estonia and was expected to meet the needs of not only Estonia but Latvia and Lithuania as well. However, it is our belief that there is a need to rethink the industrialization policy and move away from Soviet-style large-scale operation and technology. The scale and the technology should fit and be appropriate for the situation. In addition, we believe that the initial goals of the industrialization policy should be modest. Primary emphasis at this point should be on import substitution, empowerment of the farmers, and encouragement of small-scale private enterprise for which the raw material is locally available.

The scale of operations should be commensurate with the level of local demand and capability of the oilseed production sector. It should be recognized that oilseed production is rather low and cannot meet the demand from larger processing plants. Rather than establish large plants in anticipation of larger crops, the philosophy should be to expand processing capacity as the agricultural output increases.

We therefore propose that the three countries encourage establishment of small-scale plants. Although oil crushing plants come in all sizes in different parts of the world, a suitable and economically viable size may be a plant to process 20 tons of seeds per day. This plant will yield approximately 6 tons of rapeseed oil per day. Consequently, a 6 tpd oil refining plant is needed to complement the seed crushing plant. Such plant capacities are generally unthinkably small in the West. For example, in the United States, plant suppliers will consider a 75 tpd oil refining plant to be a small plant.[19] Plant capacities of oil refineries in Western countries range from 300 to 3,000 tpd. Investments in such large sized plants will run into multimillion dollars and out of reach of investors in the three Baltic States. Such large plants are also unrealistic because of the rapeseed output and market sizes of the three countries.

Note that there is always room for expansion, provided the investors do not lose confidence in the feasibility of such plants. The larger plants, which do not run on full capacity, will not be commercially profitable or feasible at first.

Small crushing plants can be installed in a space of 1000 m^2 at an estimated cost of US$300,000. A small 6 to 10 tpd oil refinery may be installed in a space of 4000 m^2 at an estimated cost of US$800,000.[20] This kind of investment is within the reach of private investors or farm cooperatives in the Baltics. Many former farm cooperatives in the Baltics showed interest in establishing such plants. The major attraction of these small plants is that they give ownership to farmers who can see the benefits

of cultivating rapeseed. For them, the plant will provide a way to convert their crop into a value-added product.

Both oil and oilmeal should find ready market in the local economies or within the region. And as the farmers start visualizing the potential benefits of cultivating rapeseed, more production will be forthcoming. As more seed production is realized, more crushing plants and refining plants can be established.

The Seed Crushing Plant

The simplest method of extracting vegetable oil from the oilseeds is to press the oilseeds through mechanical screw presses known as *expellers.* Most of the oil can be recovered in two or three sequential crushings. The residual oil content in the oilmeal is 7 to 9 percent. If a higher degree of oil recovery is desired, a more sophisticated solvent extraction system must be installed. With additional extraction using solvents, the residual oil can be as low as 0.5 percent.

Solvent extraction plants are, however, better suited for handling at least 125 to 150 tons of rapeseed per day. For smaller capacities, it is not economically feasible to install a solvent extraction plant. Particularly for small-scale operators, oil expelling is a better alternative. Moreover, the oilmeal with 8 percent oil content is suitable for use as cattlefeed and may be marketed locally. The extracted oil may be sold as crude oil or can be refined in small-scale refineries.

The expellers work efficiently if the moisture content in the oilseed is no more than 10 percent. The seeds obtained directly from the farms may have higher moisture content, usually in the range of 12 to 15 percent. It is, therefore, necessary to dry the seed either before storage or during processing. By using seed drying equipment before storing, processors can prevent the seeds from deteriorating. It is desirable to purchase drying and other preparatory equipment with the expellers.

The oilmeal, which is a high protein source, can be mixed with other feed materials to make animal feed. Appropriate equipment may be needed to prepare the feed in desirable composition and texture.

Oilseed crushing plants can be set up in even smaller capacities. In developing countries, for example, small plants can be set up to handle as little as 1.5 tons of seed per day. Such a plant takes a space of 300 m^2 and can be set up for as little as US$30,000. It is not uncommon to have plants that are between 1.5 tpd and 20 tpd. Of course, developed countries have plants with significantly higher capacities.

Appendix A illustrates the economics of owning and operating a seed crushing plant. The plant, if operated 24 hours a day for 250 days per year, has the potential of yielding a profit of US$ 191,250. The plant would more than pay for itself in less than two years, a decidedly profitable investment proposal.

Seed crushing plants without oil refineries will be less valuable as is evident from the experiences of the Liepaja plant in Latvia. While the crushing plants-and the refining plants do to have to be installed by the same investors or at the same location, the coordinated installation and operation of both is important for sustaining this industry in a country.

The Oil Refining Plant

Oils contain free fatty acids, gummy matter, coloring pigments, and smelly residue. In some of the developing countries poor people may use unrefined raw oil for cooking needs but others prefer oils that have no color, taste, or smell. Therefore, these naturally occuring, undesirable impurities need to be removed from the oil during the refining process.

For small-scale oil refineries, batch-type processing is recommended because it is easy, economical, and requires minimal investment in plant cost. In this process, the raw oil is first subjected to a hot water treatment to remove gummy materials and then subjected to an alkali (caustic soda) treatment to neutralize the free-fatty acids. The alkali reacts with fatty acids and forms soap. The soap is allowed to settle to the bottom and is removed from the bottom of the vessel. A hot water wash flushes the remainder of the soap. The soapy water is also removed from the bottom of the vessel. Three or four washes are necessary to free the oil of soap.

Since water is used to washi the oil, some water mixes with the oil and must be removed. The oil is transferred to another vessel where it is heated to 90°C and subjected to depressurized conditions. This process removes the moisture from the oil. Next, bleaching materials such as activated carbon and/or Fuller's Earth are added to the oil. After about an hour, the oil is filtered to remove the bleaching materials. The resulting oil is free of coloring pigments so it is clear.

Bleached and filtered oil is then transferred to another vessel where it is heated to 200 °C under highly depressurized conditions. Steam is injected into the oil to lift the odoriferous (smelly) matter and leave the oil free of any taste or odor. The oil is then cooled and filtered to give it a shiny appearance.

Finally the completely refined oil is packed in appropriate containers for consumers. This oil is a wholesome cooking oil which can be used for deep frying, as salad oil, or for making mayonnaise.

In order to make margarine, the refined oil needs to be hydrogenated: the liquid oil is converted to solid at room temperature. However, the process of hydrogenation is not economical for plant capacities of less than 25 tons of oil per day. The investment in a hydrogenation plant is about three times that of an oil refining plant.

Appendix B illustrates the economics of owning and operating an oil refining plant. If operated 24 hours a day for 250 days per year, it has the potential of yielding a profit of US$807,500. The plant would pay for itself in roughly one year, a decidedly profitable investment proposal.

Please note that the economic feasibilities reported in this study are based on *estimated* costs. All costs are subject to change and thus they should be verified and adapted if necessary. The prices of raw materials and finished products may also change, and could alter profitability calculations. We should exercise caution in interpreting these calculations and recalculate at the time of embarking upon a specific project.

Market for Oil Crushing and Refining Equipment

Given the current state of oil crushing and refining industries in the three Baltic states, the market for equipment for large-scale operations is virtually nonexistent. The major barriers include lack of oilseeds, lack of export markets, small domestic markets, and lack of capital, especially low-cost capital. Moreover, the free market trends preclude government support and protection.

On the other hand, the equipment for small-scale operations appears to have a great deal of potential. The nature of the market and the economics of operating in the Baltic States favors U.S. manufacturers/suppliers of small-scale oil production equipment. Note, however, that what we refer to as small scale may actually be micro-scale for most U.S. firms.

As the economies of the three countries develop, their oil consumption will increase, oilseed production will increase, and capital will be available. At that point the countries will be ready for larger plants.

For brief profiles of Lithuania, Latvia, and Estonia, please refer to Appendix C, which contains a list of useful contacts for those interested in pursuing the options and opportunities we have discussed.

Figure l. The Baltic States

Table 1
World Oilseed Cultivation (million metric tons)

	1987/88	1988/89	1989/90	1990/91	1991/92
Soybean	103.81	95.64	107.27	103.62	107.01
Cottonseed	32.07	33.19	30.89	33.48	35.07
Rapeseed	23.46	22.73	21.85	25.78	27.09
Peanut	20.98	23.28	22.06	22.12	22.52
Sunflowerseed	20.92	20.36	21.87	22.02	21.60

Source: Bill Howard, Oils & Oilseeds to 1996, The Economist Intelligence Unit.

Table 2
Total Oil Production for 1991/92 ('000 tons)

	Soybean	Palm-	Rape-	Sun-flower	Ground-nut	Cotton	Coconut	Palm kernel	Total
USA	6,382	-	79	334	100	545	-	...	7,439
Malaysia	74	6,246	-	-	...	...	31	923	7,273
EC	2,311	-	2,877	1,638	11	97	49	15	6,998
China	519	14	2,197	260	1,270	917	-	...	5,177
India	364	9	1,708	348	1,731	418	234	...	4,813
Brazil	2,718	59	-	13	16	178	-	8	2,992
Former USSR	160	-	80	1,789	1	817	-	...	2,848
Indonesia	69	2,901	-	-	18	...	741	217	3,946
Argentina	1,217	-	-	1,190	35	72	-	...	2,513
Eastern Europe	166	-	529	759	7	...	3	...	1,464
Japan	680	-	839	-	...	7	27	2	1,555
Philippines	5	60	-	-	...	...	1,087	6	1,158
Canada	197	-	647	30	...	...	-	...	874
Nigeria	-	623	-	-	...	...	-	96	719
Others	1,669	1,838	550	843	791	1,170	656	279	7,795
Total	16,531	11,750	9,505	7,203	3,980	4,220	2,827	1,547	57,563

Source: Bill Howard, Oils & Oilseeds to 1996, The Economist Intelligence Unit.

Table 3
Per Head Vegetable Oil Consumption, 1983/84-1991/92

Region	1983/84 Consumption per Head (kg/head).	1991/92 Consumption per Head (kg/head)	Annual Average Growth (%)	Volume Growth 1983/84-1991/92 (kg/head)
North America	22.9	28.2	2.6	5.3
Western Europe	15.1	22.5	5.1	7.4
Japan	12.9	15.7	2.5	2.8
East. Europe & USSR	11.7	13.7	2.0	2.0
S.& C. America	10.4	12.1	1.9	1.7
Middle East	7.4	10.1	4.0	2.7
Far East & Oceania	6.3	9.6	5.4	3.3
Africa	5.2	7.2	4.1	2.0
China	4.5	6.3	4.4	1.8
India	5.7	6.1	0.9	0.4
World	8.3	10.6	3.1	2.3

Source: Bill Howard, Oils & Oilseeds to 1996, The Economist Intelligence Unit.

Table 4
Estimated Vegetable Oil Demand in the Baltics

	Population	**Current Rate @ 8 kg/year**	**Eastern** Europe Rate @ 14 kg/year	EC Rate @22.5 kg/year
Estonia	1.6 million	12,800 mt	22,400 mt	36,000 mt
Latvia	2.6 million	20,800 mt	36,400 mt	58,500 mt
Lithuania	3.8 million	30,400 mt	53,200 mt	85,500 mt

Table 5
World Livestock Populations, 1990

	Cattle (`000)	Sheep & Goat (`000)	Pigs ('000)	Poultry (m)
North America	111,375	13,363	66,134	1,747
South & Central America	316,720	156,399	77,388	1,339
Western Europe	88,114	116,931	111,826	907
Eastern Europe	37,455	49,468	74,126	487
CIS	119,600	217,600	78,100	1,207
China	77,141	180,538	348,954	2,315
Japan	4,682	67	11,866	330
India	195,500	160,486	10,300	270
Africa	185,794	370,178	13,097	873
Middle East	66,516	234,666	447	700
Far East & Oceania	78,574	273,871	53,964	1,058

Source: Bill Howard, Oils & Oilseeds to 1996, The Economist Intelligence Unit.

Table 6
World Oilmeal Consumption by Region
1983/84-1991/92 ('000 tons)

	1983/84	1991/92	Annual Average Growth (%)
Western Europe	30,291	41,703	4.6
North America	19,785	26,530	3.2
Eastern Europe & USSR	11,641	12,626	3.0
China	10,449	10,783	-2.4
Far East & Asia	4,229	8,389	10.9
India	4,632	7,748	6.2
South & Central America	4,689	6,914	3.6
Japan	4,679	5,793	3.6
Africa	1,855	3,135	5.9
Middle East	2,770	4,524	4.2
Total	95,020	128,145	3.3

Source: Bill Howard, Oils & Oilseeds to 1996, The Economist Intelligence Unit.

Table 7

World Oilmeal Consumption by Type and Region, 1991/92 (`000 tons)

	North America	South Central America	Western Europe	Eastern Europe & USSR	China	Japan	India	Africa	Middle East	Far East	A
Soybean	23,067	4,858	21,062	6,898	794	3,450	275	1,427	1,625	5,588	0
Sunflower	410	391	3,827	2,904	568	-	381	473	483	229	0
Rapeseed	776	174	4,735	749	3,436	1,307	2,261	9	314	805	W~
Palm kernel	-	84	1,561	26	-	2	-	133	-	134	
Copra	-	77	898	2	...	13	116	137	5	495	
Cottonseed	1,619	982	1,164	1,894	3,959	22	2,451	659	2,059	471	
Groundnut	116	67	412	77	1,984	1	2,264	251	-	492	
Corngluten	542	280	8,044	75	43	997	-	86	37	175	
Total	26,530	6,914	41,703	12,626	10,783	5,793	7,748	3,175	4,524	8,389	

Source: Bill Howard, Oils & Oilseeds to 1996, The Economist Intelligence Unit.

Table 8
Livestock Populations in the Baltics, 1990/92

	Cattle ('000).	Pigs ('000)	Poultry (m)
Estonia			
1990	806	1080	6923
1991	758	960	6536
1992	708	798	5229
Latvia			
1990	1472	1555	11246
1991	1382	1410	10321
1992	1431	1181	8250
Lithuania			
1990	2422	2730	17486
1991	2321	2436	16815
1992	2100	1912	10000

Source: Organization for Economic Cooperation and Development (OECD)

Table 9
Average Protein Consumption in kg per Livestock Unit, 1990

North America	164.9
South & Central America	16.2
Western Europe	276.3
Eastern Europe	86.4
CIS	50.1
China	38.4
Japan	481.5
India	24.1
Africa	11.0
Middle East	62.3
Far East & Oceania	50.0

Source: Bill Howard, Oils & Oilseeds to 1996, The Economist Intelligence Unit.

APPENDIX A
ECONOMICS OF OIL EXPELLING (20 TPD):

		Investment	Capital Cost	Processing Cost/day	Revenue/ Day	Profit
Investment Cost:						
Plant Cost (F.O.B. Des Moines, U.S.A.)		$250,000				
Other Costs (Freight, Erection, Building, etc.)		$ 50,000				
Total Cost		$300,000				
Working capital for 7 days (3 shift working)		$ 20,000				
Capital Cost:						
Interest on 320,000 @ 17% per year			$54,000			
per day (250 day/year)				$,218		
Depreciation on 320,000 @ 10% per year			$ 32,000			
per day (250 day/year)				$,128		
Processing Cost:						
Rapeseed	(20 tons @ $145.00 per ton)			$ 2,900		
Power	(3000 kWFl @ $ 0.05 per kWl I)			$,150		
Labor	(15 workers @ $ 5.00 per head)			$,075		
Mainten.	(3 workers @ $ 8.00 per head)			$,024		
Spares				$,050		
Overheads:						
Office & Staff				$,060		
Marketing				$,040		
Total Expenses per Day				$ 3,645		
Revenue:						
Oil	(6.0 tons @ $ 400.00 per ton)				$ 2,400	
Oilmeal (13.4 tons @ $ 150.00 per ton)					$ 2,010	
Total per day					$ 4,410	
Profit per day						$,765
Profit per year						$191,250

APPENDIX B
ECONOMICS OF OIL REFINING (10 TPD)

	Investment	Capital Cost	Processing Cost/t day	Revenue/t Day	Profit
Investment Cost:					
Plant Cost (F.O.B. Des Moines, U.S.A.)	$650,000				
Other Costs (Freight, Erection, Building, etc.)	$150,000				
Total Cost	$800,000				
Working capital for 7 days (3 shift working)	$ 28,000				
Capital Cost:					
Interest on $442,000 @ 17% per year		$140,760			
per ton of raw oil			$,056		
Depreciation on $400,000 @ 10% per year		$80,000			
per ton of raw oil			$,032		
Processing Cost (per ton of raw oil):					
Rapeseed Oil (1.0 t @ $ 400.00 per ton)			$,400		
Utilities & Supplies			$ 15		
Labor			$ 5		
Maintenance			$ 2		
Overheads:					
Office & Staff			$ 10		
Marketing			$ 4		
Total cost per ton of raw oil			$,534		
Total cost per ton of refined oil (1 t of raw oil gives .95 t of refined oil)			$,562		
Packing cost (if packed in plastic bottles)			$ 98		
Total cost per ton of packed refined oil			$,660		
Total cost per day of packed refined oil			$ 6,270		
Revenue:					
Oil per day (9.5 t @ $ 1000.00 per ton)				$ 9,500	
Profit per day on 9.5 ton of refined oil					$ 3,230
Profit per year (250 day/year)					$807,000

A,PPENDIX C

COUNTRY PROFILES

ESTONIA

Population	1,600,000
Area	45,215 km'
Currency	Kroon
Exchange (1994)	US$ 1 = Kroons 14.40
Inflation (1992)	1069.3% (est.94: 50%)
GDP (1992)	US$ 864 m
Imports	US$ 446 m
Exports	US$ 457 m

Main Trading Partners:
Finland, Russia, Sweden, Germany

Major Banks:
Bank of Estonia (Central Bank), Savings Bank, Agricultural Bank, Bank for Industry & Commerce, Social Bank, Tartu Commercial Bank, Bank of Tallinn, Union Baltic Bank.

Tax Rates
- Individuals 16-33%
- Corporate 15-30%
- VAT Rate 18%

Government:
- Parliamentary Democracy
- Head of State: President
- Head of Government: Prime Minister

Business Contacts: (Country Code is 372 and the code of Tallinn is 2)

Eastern Europe Business Infonmation Center
U.S. Department of Commerce
Intl. Trade Admin. Room 7412
Washington D.C. 20230
Tel: 202-482-2645
Fax: 202-482-4473

Embassy of Estonia
1030 15th Street, Suite 1000
Washington, D.C.
Tel: 202-789-0320
Fax: 202-789-0471

American Embassy
Kentmanni 20
EE-0001 Tallinn
Tel: 358 303 182 (via Helsinki)
Fax: 358 306 817 (via Helsinki)

Estonia Chamber of Commerce and Industry
Toom-Kooli 17
EE-0100 Tallinn
Tel: 444 929
Fax: 443 656

Estonian Privatization Agency
6 Ravala Boulevard
EE-0100 Tallinn
Tel: 454 439
Fax: 454 450

COUNTRY PROFILES

Ministry of Agriculture
Lai 39/41
EE-0100 Tallinn

Tel: 441 166
Fax: 440 601

LATVIA

Population	2,600,000
Area	64,589 km'
Currency	Lat
Exchange (1994)	US$1 = Lats 0.57
Inflation (1993)	109% (est. 94: 40%)
GDP (1993)	US$ 1,139 m
Imports (1993)	US$ 954 m
Exports (1993)	US$ 1008 m

Main Trading Partners:
Russia, Germany, Sweden, U.K.

Major Banks:
Bank of Latvia, Savings Bank of Latvia, Riga Commercial Bank, Baltija Bank, Union Baltic Bank in Riga, Olimpija Bank, Latvian Industrial Bank, Latvian Investment Bank

Tax Rates:

Individuals	15-35%
Corporate	15-35%
VAT Rate	10% plus 2% at retail

Government:
Parliamentary Democracy
Head of State: President
Head of Government: Prime Minister

Business Contacts: (Country code is 371 and the code of Riga is 2)

Eastern Europe Business Information Center
U.S. Department of Commerce
Intl. Trade Admin. Room 7412
Washington D.C. 20230

Tel: 202-482-2645
Fax: 202-482-4473

Embassy of Latvia
4325 17th Street N.W.
Washington, D.C. 20011

Tel: 202-726-8213
Fax: 202-726-6785

American Embassy
Raina Boulevard 7
LV-6050, Riga

Tel: 358 311 348 (via Helsinki)
Fax: 358 314 665 (via Helsinki)

Latvian Chamber of Commerce & Industry
21 Brivibas Bulvaris
LV-6189, Riga

Tel: 332 205

COUNTRY PROFILES

Latvian Development Agency
2 Perses St.
LV-1442, Riga

Tel: 287 995
Fax: 282 524

Ministry of Agriculture
Republikas Laukums 2
LV-1981, Riga

Tel: 320 162
Fax: 320 593

LITHUANIA

Population	3,800,000
Area	65,200 km^2
Currency	Litas
Exchange (1994)	US$ 1 = Litas 4.00
Inflation (1992)	409.2% (est. 94: 70%)
GDP (1993)	US$ 3,450 m
Imports (1993)	US$ 2,450 m
Exports	US$ 2,177 m

Main Trading Partners:
Germany, Poland, Finland, U.K., Russia

Major Banks:
Bank of Lithuania, Savings Bank, Agricultural Bank.

Tax Rates:

Individuals	33%
Corporate	29%
VAT Rate	15%

Government:
Parliamentary Democracy
Head of State: President
Head of Government: Prime Minister

Business Contacts: (Country code is 370 and the code of Vilnius is 2)

Eastern Europe Business Information Center
U.S. Department of Commerce
Intl. Trade Admin. Room 7412
Washington D.C. 20230

Tel: 202-482-2645
Fax: 202-482-4473

Embassy of Lithuania
2622 16th St. NW
Washington, DC 20009

Tel: 202-234-5860
Fax: 202-328-0466

American Embassy
Akmenu 6
232600 Vilnius

Tel: 222 724
Fax: 222 779

COUNTRY PROFILES

Lithuania Chamber of Trade and Industry
Algirdo 31
2600 Vilnius

Tel: 661 550
Fax: 661 550

Ministry of Agriculture
Gedimino pr. 19
2025 Vilnius

Tel: 629 994
Fax: 224 440

ENDNOTES

1. Agricultural Policies, Markets and Trade Monitoring and Outlook 1993, OECD.

2. Personal interview with Mr. Renaldo Mandmets, European Community Project Group, Ministry of Agriculture, Republic of Estonia.

3. Personal interviews with Mr. Janis Urbanovich, Director, Latgale Satio, Darzu Street 7a, Rezenke, Latvia 4601; Mr. Berzinsh Ilmars Georgievich, Director, Bauska Agro-Industrial Complex, Bauska, Latvia; Mr. Skroders, Head Agronomist, Agrofirm "Bulduri" SIA, Bulduri, Latvia; Mr. Valdis Dulmanis, Lacplesis Agrofirma, Lielvarde, Lativa; Mr. Henrihs Nagla, Department of Crop processing, Ministry of Agriculture, Latvia; Mr. Renaldo Mandmets, Rural Development International and Ministry of Agriculture, Estonia; and Mr. Rimas Varkulevichius, Director of the Department of International Relations, Ministry of Agriculture, Lithuania.

4. Weiss, T.J. Food Oils and Their Uses, Avi Publishing Co., Inc., Westport, CT. 1970.

5. Ian McCormick and Roger Hoskin Canola: Prospects for an Emerging Market, Oil Crops Situation and Outlook Report, Commodity Economics Division, Economic Research Service, USDA, October 1991, OCS-31.

6. Thomas W. Bickerton, USSR Oilseed Production, Processing, and Trade, Commodity Economics Division, Economic Research Service, USDA, September 1987.

7. Personal Interview with Mr. Toomas Kevvai, Counsellor, Ministry of Agriculture, Estonia.

8. George Liepa, Oilseeds in Latvia -- What Lies Ahead? Inform, vol 4, no. 4 (April 1993).

9. George Liepa, Oilseeds in Latvia -- What Lies Ahead, Inform, vol.4, no. 4 (April 1993).

10. Personal interview with Mr. Skroder, Head Agronomist, Agrofirm "Bulduri" SIA, Bulduri, Latvia.

11. Personal interview with Zigmars Brunavs, Canadian Agra, Riga, Latvia.

12. Personal interview with Rimas Varkulevichius, Director of the Department of International Relations, Ministry of Agriculture, Lithuania.

13. Kazlauskiene, Natalia, William H. Meyers, and Kyle J. Stephens (1991), The Lithuanian Agricultural and Food Industry: The Setting for Economic Reforms, Ames, IA: Center for Agricultural and Rural Development. Report 91-BR 3.

14. Personal interview with Mr. Hans G. Lindberg, General Manager, Alfa Laval International Engineering AB, Riga, Latvia.

15. Personal interview with Mr. Hans G. Lindberg, General Manager, Alfa Laval International Engineering AB, Riga, Latvia.

16. Personal interview with Toomas Kevvai, Counsellor, Ministry of Agriculture, Estonia.

17. George Liepa, ibid.

18. Steven B. Nemeth, Trip Report, no. 127, ASA, Nov. 1993.

19. Personal interview with Mr. Nits Tervell, Sales Area Manager, Tetra Laval Food, Stockholm, Sweden.

20. Personal interview with Ms. Inguna Gulbe, Director of the Department of Foreign Relations, Ministry of Agriculture, Latvia.

21. Personal interview with Mrs. Irana Anshevica, Senior Manager, LATA International Ltd., Riga, Latvia.

22. Personal interview with Mr. Maris Ermanis, Senior Manager, LATA International Ltd., Riga, Latvia

23. Personal interview with Mr. Zigmars Brunavas, Canadian Agra, Riga, Latvia.

24. Personal interview with Mr. Valdis Dulmanis, Lacplesis Agrofirma, Lielvarde, Latvia.

25. Personal interview with Mr. Jevgenijs Hinevics, Director, Balttur SIA, Riga, Latvia

26. Personal interview with Dr. Aloyzas Zelvys, Chairman and General Director, Grudtarna Joint Stock Co., Vilnius, Lithuania.

27. Personal interview with Dr. Aloyzas Zelvys, Chairman and General Director, Grudtarna Joint Stock Co., Vilnius, Lithuania.

28. Trip Report No. 127, November 1993, Dr. Steven B. Nemeth, Director, American Soybean Association, Vienna.

29. Personal interview with Ms. Laima Jureviciene, Specialist on Vegetable Oil Industry, Food Industry Department, Ministry of Agriculture, Lithuania.

30. Trip Report No. 124, September 1993, Dr. Steven B. Nemeth, Director, American Soybean Association, Vienna.

31. Bickerton, Thomas W., "USSR Oilseed Production, Processing, and Trade," Commodity Economics Division, Economic Research Service, U.S. Department of Agriculture.

32. Personal interview with Mr. Henrihs Nagla, Department Manager, Crop Processing, Ministry of Agriculture, Latvia.

33. Shaffer, Creg V. (1993), An Analysis of Consumption and Expenditures for Lithuanian Households Using Budget Survey Data, Ames, IA: Center for Agricultural and Rural Development. Report 93-BR 8.

34. Personal study of the markets in Estonia, Latvia, and Lithuania.

35. Personal interview with Mr. Arvo Hiller, Director, Formeer Ltd., Tallinn, Estonia.

36. Trip Report No. 124, September 1993, Dr. Steven B. Nemeth, Director, American Soybean Association, Vienna.

37. Trip Report No. 106, August 1992, Dr. Steven B. Nemeth, Director, American Soybean Association, Vienna.

38. Trip Report No. 115, March 1993, Dr. Steven B. Nemeth, Director, American Soybean Association, Vienna.

39. Telephone interview with Mr. Barry V. Smith, Managing Vice President and General Manager, Wurster & Sanger, Division of Crown Iron Works, Minneapolis, MN.

40. Based on estimates provided by various equipment suppliers. Note that these prices are representative and must be verified with the suppliers. The prices mentioned here are those that were the most competitive prices supplied by American companies.