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U.S. Exports of Value-added Wheat Products: Recent Trends and Contributing Factors

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Highlights

Between 1986 and 1992, world trade in high-value agricultural exports reached record highs each year. Since 1991 the value of U.S. exports of high-value agricultural products has exceeded the value of traditional bulk product exports each year. U.S. exports of highly processed wheat products have increased dramatically in recent years. Despite these increases, wheat product exports are small, in quantity and value, relative to wheat exports. This report presents recent trends in U.S. exports of highly processed wheat products, including bakery products, breakfast cereals, pasta, and snacks. Trends in exports are related to changes in demographics and trade policies.

Major findings include the following:

- *U.S. exports of highly processed wheat products have increased in quantity exported, ranging from a 108% increase in snack products to a 298% increase in breakfast cereals, between 1983 and 1991.*

- *Canada is the largest market and has been a growing market.*

- *Mexico has been the fastest growing market, although the total size of the market is still relatively small.*

- *In addition to Canada and Mexico, Asia and the European Community have had above average growth in their imports of one or more of these U.S. wheat products.*

- *Demographic factors contributing to the increased export of U.S. wheat products include worldwide income growth, changing household and work force composition, changing diets, and increasing urbanization.*

- *Policies were in effect which increased ingredient (wheat) costs for Canadian food processors giving a competitive advantage to U.S. processors.*

- *Policies were in effect in Mexico which favored wheat product trade relative to wheat trade.*

- *Countries which were the largest and/or fastest growing markets may not be in the future. Many countries in Asia, Eastern Europe, and Latin and South America are just beginning to exhibit the demographic changes that affect the consumption of highly processed foods.*

U.S. Exports of Value-added Wheat Products: Recent Trends and Contributing Factors

Joyce Hall Krause, William W. Wilson, and Frank J. Dooley*

Introduction

World trade in high-value agricultural products has increased three to four fold since 1970. Between 1986 and 1992, world trade in high-value agricultural exports reached record highs each year (FAS, 1993). Growing incomes worldwide, changing household and work force compositions, changing diets, and technological improvements in transportation, marketing, and product handling are credited for much of these gains (Harrison, 1992; Tomoda, 1992).[1]

Through the mid-1980s, high-value agricultural products accounted for about one-third of the value of U.S. agricultural exports. Since 1985, this share has been rising; and in fiscal year 1991, the value of U.S. exports of high-value products exceeded traditional bulk products (MacDonald, 1991). This trend continues into 1993 (FAS, 1993). Considerable interest exists to promote value-added product exports. World markets for commodities are maturing while markets for value-added products are growing. However, value-added product exports must compete not only with foreign competitors, but they must also compete with U.S. commodity exports.

Bulk and value-added wheat comprised about 10% of U.S. agricultural export value in 1991. International trade in highly processed wheat products, such as bakery products, pasta, and breakfast cereals, increased dramatically in the 1980s. Despite these increases in wheat product exports, the quantity and value remains much smaller than that of wheat exports. For example, the total quantity of wheat exported in 1991 was 31 million metric tons (MT) at a value of $3.35 billion whereas the total quantity and value of flour was 974,000 MT and $183 million, respectively. The quantity and value of the highly processed products presented here were 217,000 MT and $389 million, respectively.[2]

While information is available about U.S. and international trade in wheat and flour, limited information exists about trade in highly processed wheat products. The purpose of this report is to supplement existing information for wheat and flour by developing comparable information for highly processed wheat products. Trends in U.S. exports of highly processed wheat products are presented and related to demographic and trade policies. This information can be used to consider questions such as which are the best growth markets for high-value wheat products, what is the appropriate mode of entry into foreign markets, and so forth.

Data

Data are from 1983 to 1991, the latest years of published statistics from the U.S. Bureau of Census. All quantity data are reported in metric tons (MT), and all values are reported in U.S. dollars, free-alongside-ship. All exports are reported according to the harmonized system of reporting which the United States adopted in 1989 and which most major exporting and importing countries use.[3]

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Four categories of highly processed wheat products, including pasta products, bakery products, breakfast cereal products, and snack products that have a cereal grain component are considered. All bakery products are included (seven coded categories), such as cookies, cakes, breads, toasts, and puddings. All pasta products are included (11 coded categories), such as spaghetti, noodles, stuffed pastas, and canned and frozen pastas. All cereal preparations are included (three coded categories) such as all ready-to-eat or ready-to-cook cereals. Snack products include two coded categories: chips and savory snacks that are made from grain cereals, and pizza and quiche.[4,5] The harmonized codes included in each category are listed in Appendix I.

For all product categories discussed, the countries and regions reported import more than 90% of U.S. exports. Countries included in the regions are listed in Appendix II.

Trends in U.S. Exports of Value-added Wheat Products

Overview

The quantity and value of wheat product exports has increased significantly between 1983 and 1991. Growth rates in quantities exported range from 108% for snacks to 298% for breakfast cereals (Table 1). In 1983 the total quantity and total value of wheat products exported was 72,000 MT and $97 million dollars, respectively. In 1991 the total quantity of wheat product exports was 217,000 MT at a value of $389 million, representing an overall 203% increase in quantity exported and a 207% increase in the value of exports, adjusted for inflation (Figures 1 and 2).

Table 1. Percent Growth in U.S. Exports of Highly Processed[1] Wheat Products, 1983 to 1991

Country or Region	Bakery	B.Cereal	Pasta	Snack
	----------percent----------			
Western Hemisphere:				
Canada	162	410	689	163
Caribbean	(34)	233	9	(14)
Mexico	129,675	5,122	1,180	10
Latin & South America	107	89	(56)	(72)
Other:				
Asia	444	13	(50)	171
European Community	830	468	44	333
Middle East	50	143	(80)	74
Total market	176	298	190	108

[1]Numbers in parentheses are negative growth rates.

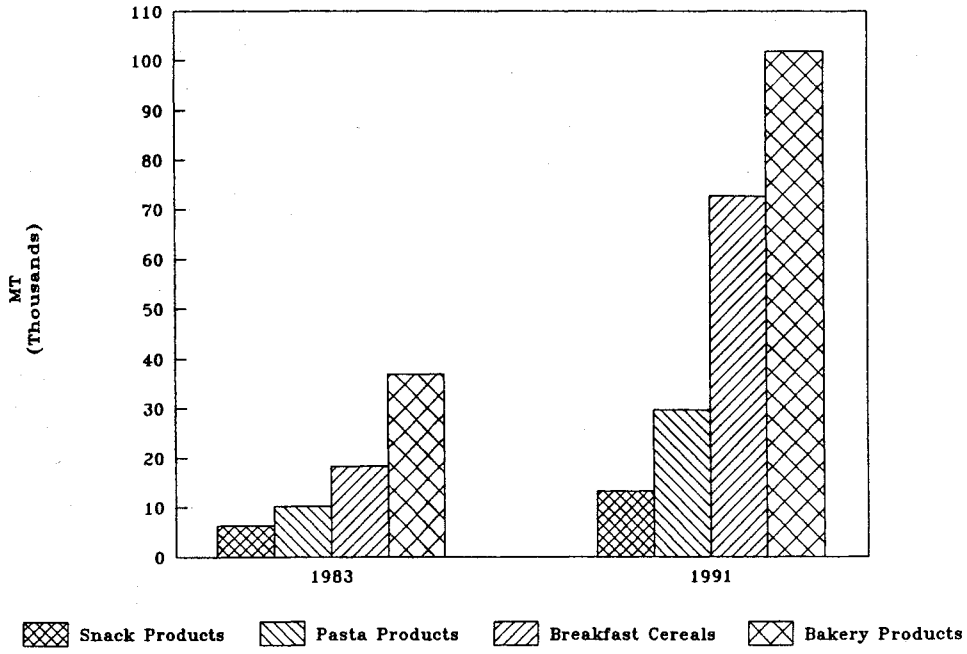

Figure 1. U.S. Exports of Wheat Products, Quantity by Category, 1983 and 1991

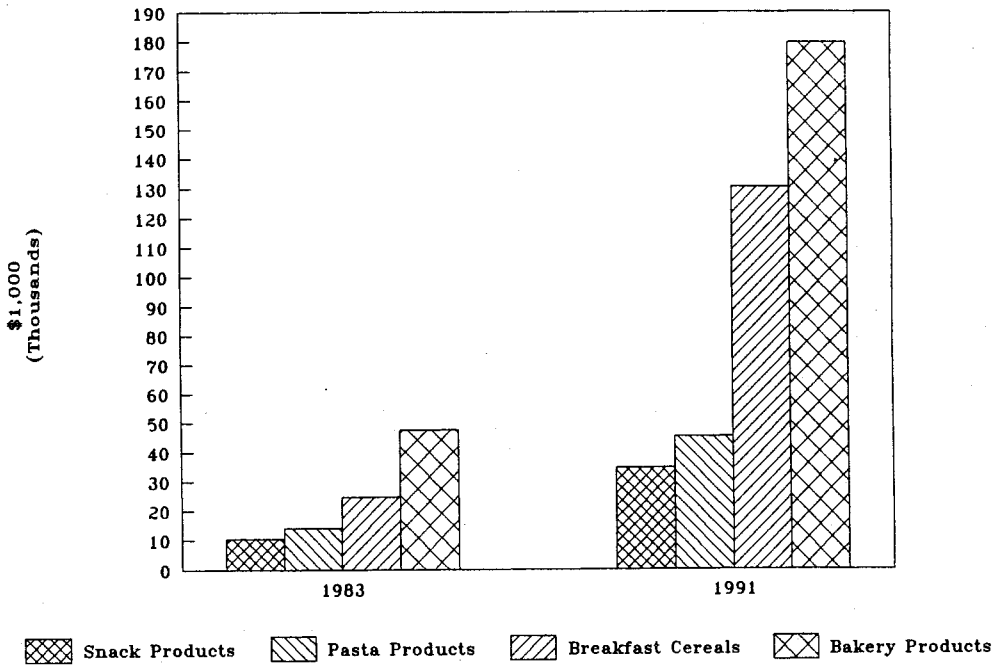

Figure 2. U.S. Exports of Wheat Products, Value by Category, 1983 and 1991

Bakery Products

Bakery products is the most important category of highly processed wheat product exports, accounting for 47% of the quantity exported in 1991 (Figure 1) and 46% of the value (Figure 2). Bakery product exports have increased 176% in quantity exported, from 37,000 MT at a value of $47 million in 1983 to 102,000 MT at a value of $179.5 million in 1991 (Figures 2 and 3).[6] Canada is the leading importer of U.S. bakery products with a 68% share of U.S. bakery exports in 1983 and a 65% share in 1991 (Table 2 and Figure 4). U.S. exports to Canada grew 162% from 25,000 MT in 1983 to 66,000 MT in 1991 (Tables 1 and 2).

Other markets with an increase in quantity include Mexico, the European Community (EC), Asia, Latin and South America, and the Middle East (Table 2). In terms of U.S. export share, Mexico, Asia, and the EC increased in importance while the Caribbean, the Middle East, and Canada decreased (Table 2 and Figure 4).

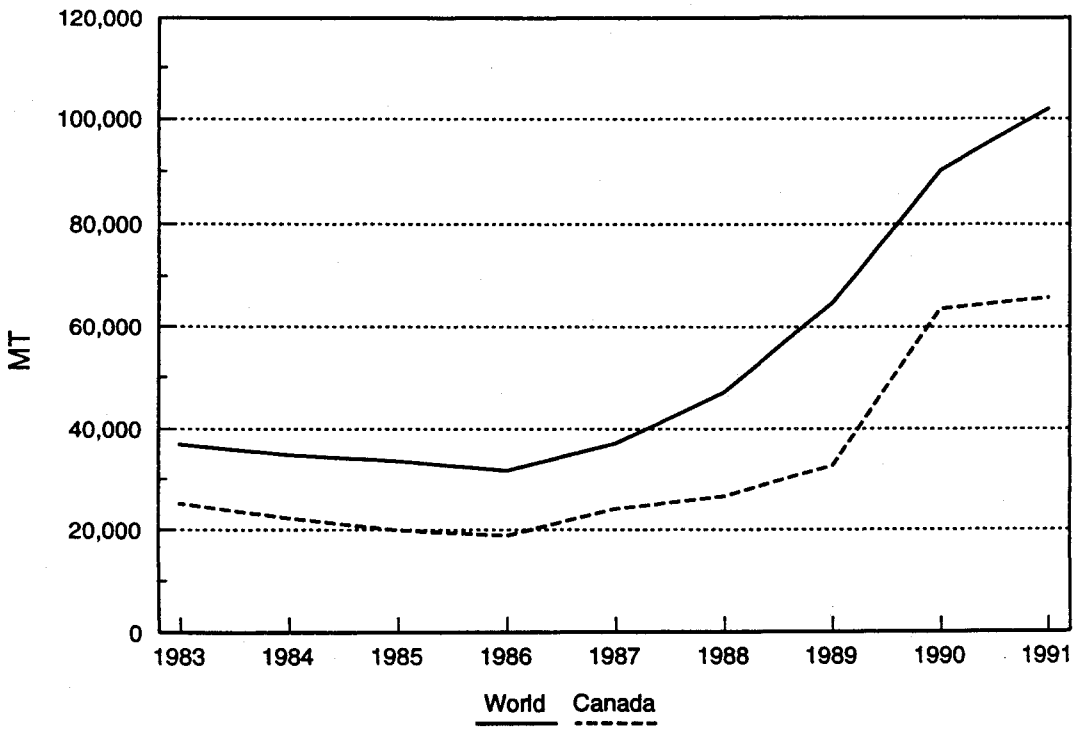

Figure 3. U.S. Exports of Bakery Products to the World and to Canada, 1983 Through 1991

Table 2. U.S. Exports of Bakery Products in 1983 and in 1991[1]

Country or Region	1983 (Share)		1991 (Share)	
	MT	(%)	MT	(%)
World Total	36,891	(100)	101,827	(100)
Western Hemisphere:				
Canada	25,164	(68)	65,834	(65)
Caribbean	5,894	(16)	3,908	(4)
Mexico	8	(0)	10,382	(10)
Latin & South America	654	(2)	1,353	(1)
Subtotal		(86)		(80)
Other:				
Asia	1,834	(5)	9,978	(10)
European Community	620	(2)	5,767	(6)
Middle East	1,753	(5)	2,634	(1)
Total selected		(98)		(99)

[1]Only 1983 and 1991 are presented to save space. Full tables are available.

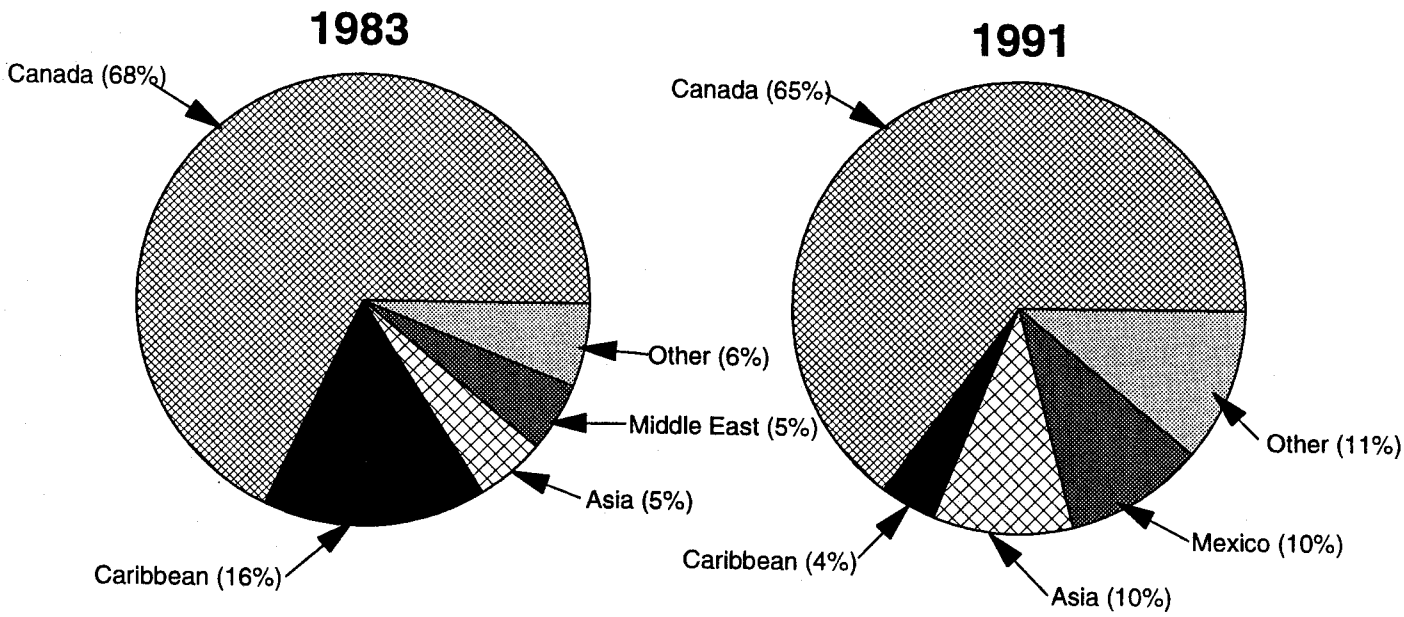

Figure 4. U.S. Bakery Exports, 1983 and 1991, by Percent to Country/Region

Breakfast Cereals

Breakfast cereals is the second most important category of wheat product exports, accounting for 33% of the quantity and 33% of the value of exports in 1991 (Figures 1 and 2). Breakfast cereals, with a 298% increase in quantity exported from 1983 to 1991, has shown the most dramatic growth (Table 1). In 1983, breakfast cereal exports were 18,000 MT, valued at $25 million. By 1991 breakfast cereal exports had increased to 73,000 MT, valued at $127.5 million (Figures 2 and 5).

All of the selected countries increased the quantity of breakfast cereal imports from the U.S. from 1983 to 1991 (Table 3). The largest importer of U.S. breakfast cereals was Canada (Figure 6). U.S. exports to Canada increased 410% over this time period with Canada's share of U.S. exports increasing from 33% to 42% (Table 1 and Figure 6).

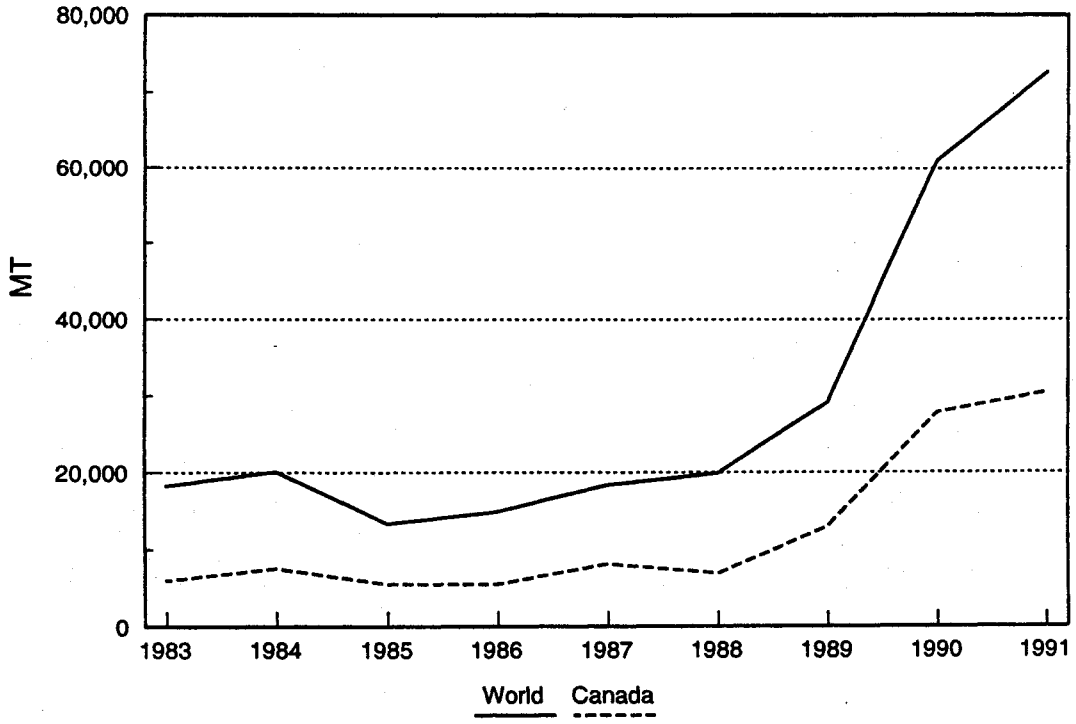

Figure 5. U.S. Exports of Breakfast Cereals to the World and to Canada, 1983 Through 1991

Table 3. U.S. Exports of Breakfast Cereals in 1983 and in 1991[1]

Country or Region	1983 (Share)		1991 (Share)	
	MT	(%)	MT	(%)
World total	18,229	(100)	72,628	(100)
Western Hemisphere:				
Canada	5,970	(33)	30,476	(42)
Caribbean	4,150	(23)	13,812	(19)
Mexico	55	(0)	2,872	(4)
Latin & South America	1,107	(6)	2,090	(3)
Subtotal		(62)		(68)
Other:				
Asia	2,451	(13)	2,763	(4)
European Community	2,663	(15)	15,123	(21)
Middle East	1,143	(6)	2776	(4)
Total selected		(96)		(97)

[1]Only 1983 and 1991 are presented to save space. Full tables are available.

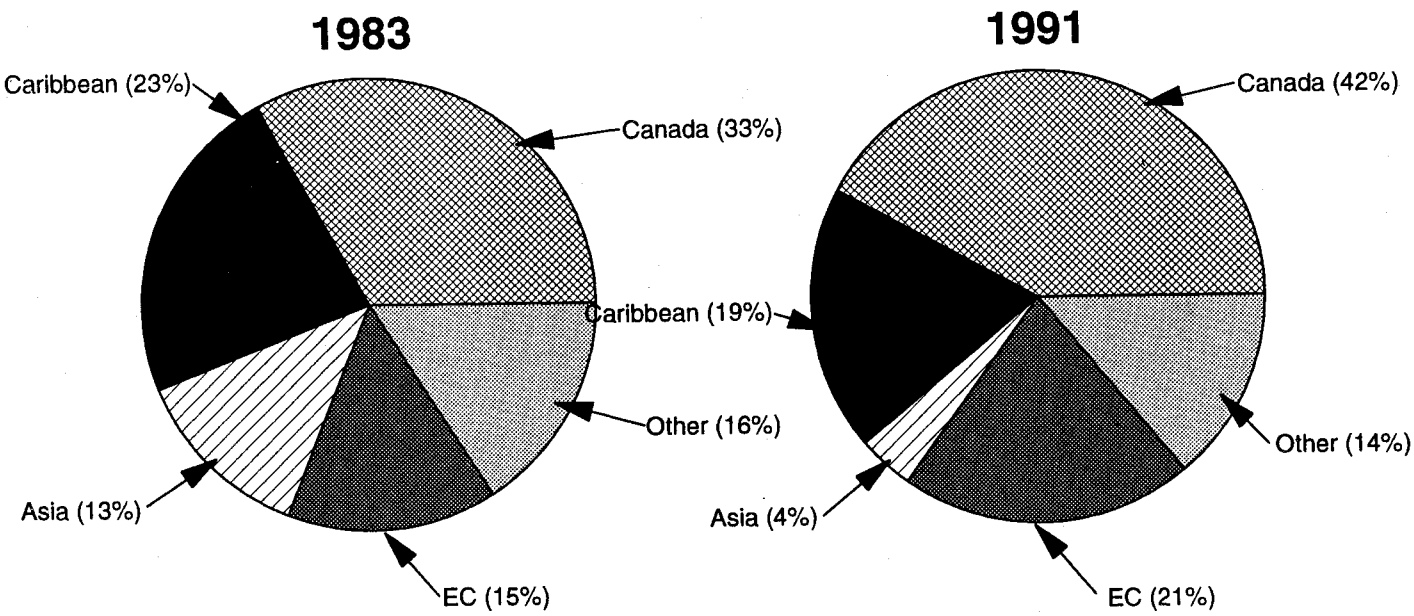

Figure 6. U.S. Breakfast Cereal Exports, 1983 and 1991, by Percent to Country/Region

Pasta

From 1983 to 1991, U.S. exports of pasta grew from 10,000 MT, valued at $14 million, to 30,000 MT valued at $45 million, a 190% increase in quantity exported (Figures 2 and 7). Unlike bakery and breakfast cereal products, pasta has not shown widespread growth in U.S. exports. Also, pasta accounted for only 14% of the quantity of U.S. exports of processed wheat products and 12% of the value in 1991 (Figures 1 and 2). Canada was the only country with significant growth (Table 4). In 1983, Canada imported just over 3,000 MT, 31% of U.S. exports; Canadian imports climbed to nearly 25,000 MT in 1991, 84% of U.S. exports (Figure 8).

The only other countries and regions showing increases in total quantity imported from 1983 to 1991 were Mexico, the EC, and the Caribbean (Table 4). Shipments to the Caribbean were 1,724 MT in 1983, and grew to 3,589 MT in 1988, and then decreased in each following year to 1991 when 1,881 MT were imported. The Middle East was a declining market. In 1983, the Middle East accounted for a 25% share of U.S. exports; in 1991 this share was only 2% (Figure 8).

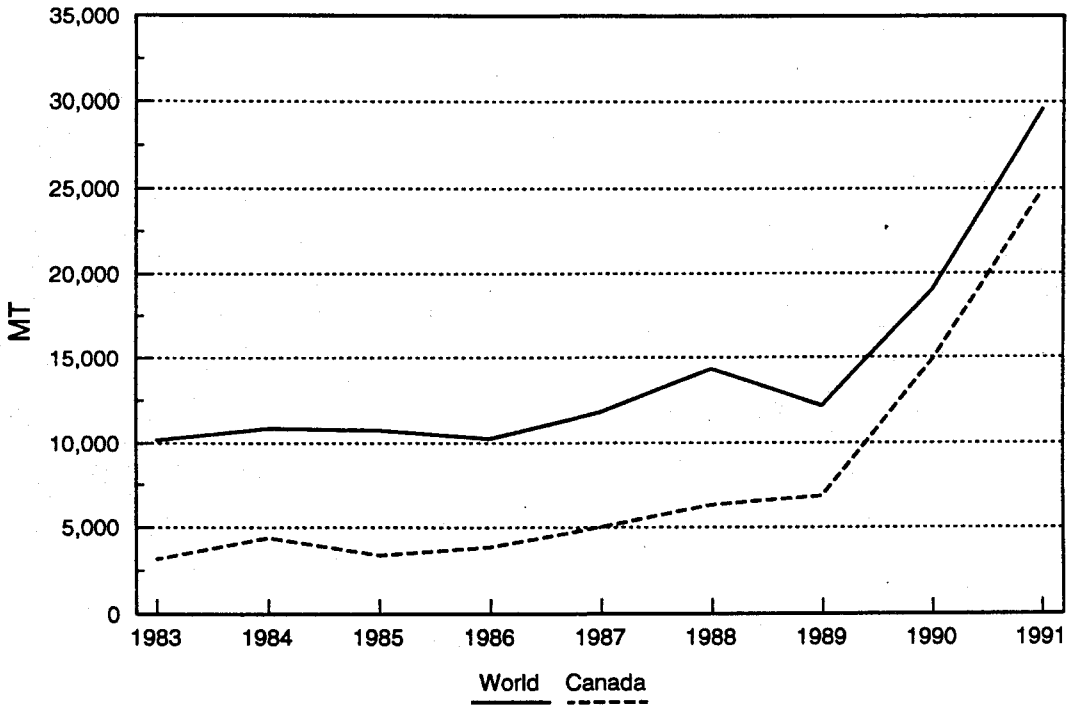

Figure 7. U.S. Exports of Pasta to the World and to Canada, 1983 Through 1991

Table 4. U.S. Exports of Pasta Products in 1983 and in 1991[1]

Country or Region	1983 (Share)		1991 (Share)	
	MT	(%)	MT	(%)
World total	10,189	(100)	29,586	(100)
Western Hemisphere:				
Canada	3,155	(31)	24,901	(84)
Caribbean	1,724	(17)	1,881	(6)
Mexico	21	(0)	269	(1)
Latin & South America	374	(4)	164	(1)
Subtotal		(52)		(92)
Other:				
Asia	1,639	(16)	827	(3)
European Community	274	(3)	395	(1)
Middle East	2,529	(25)	504	(2)
Total selected		(96)		(97)

[1]Only 1983 and 1991 are presented to save space. Full tables are available.

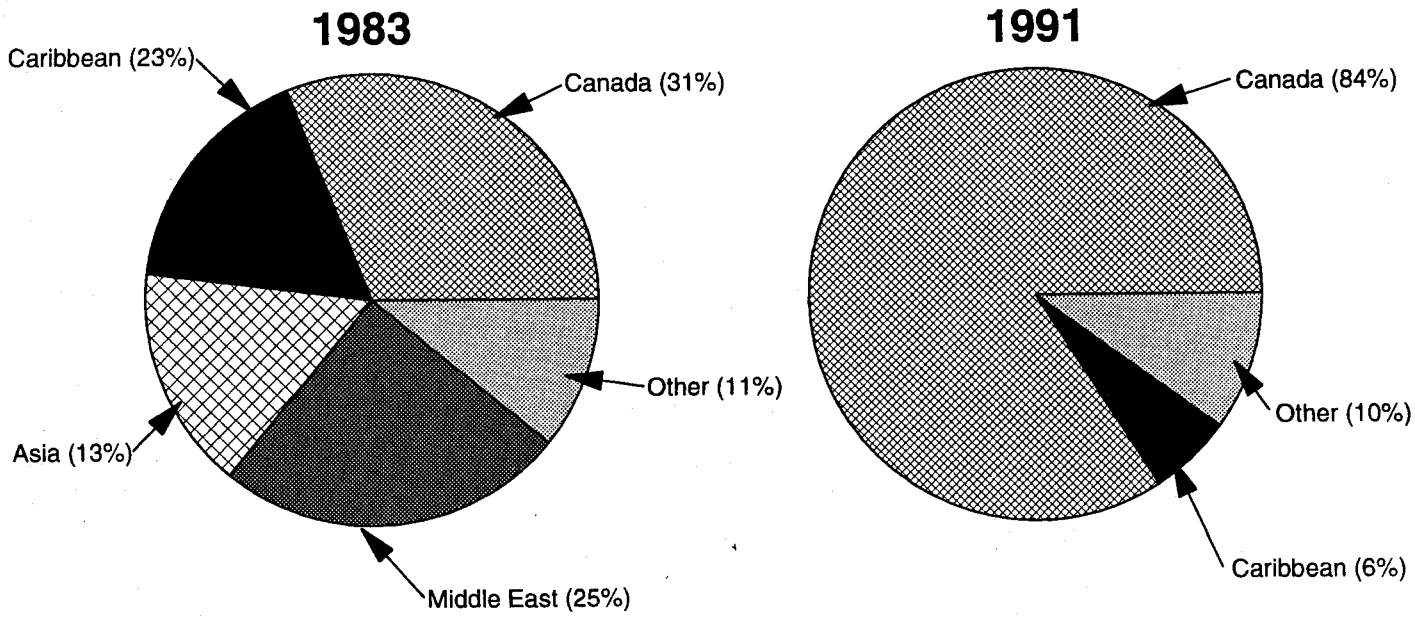

Figure 8. U.S. Pasta Exports, 1983 and 1991, by Percent to Country/Region

Snacks

Snacks is the smallest category included, with only 13,000 MT exported in 1991 (Table 5). However, it represents a significant growth market and should not be overlooked. Snack quantities exported in 1983 were 6,300 MT at a value of $10.5 million increasing to 13,000 MT in 1991 at a value of $34.5 million for a 108% increase in the quantity shipped (Figures 2 and 9).

Table 5. U.S. Exports of Snacks in 1983 and in 1991[1]

Country or Region	1983 (Share)		1991 (Share)	
	MT	(%)	MT	(%)
World total	6,318	(100)	13,150	(100)
Western Hemisphere:				
Canada	2,460	(39)	6,478	(49)
Caribbean	648	(10)	558	(4)
Mexico	293	(5)	321	(2)
Latin & South America	981	(16)	270	(2)
Subtotal		(70)		(57)
Other:				
Asia	385	(6)	1,045	(8)
European Community	578	(9)	2,500	(19)
Middle East	486	(8)	845	(6)
Total selected		(93)		(91)

[1]Only 1983 and 1991 are presented to save space. Full tables are available. Snacks include chips and savory snacks that have a cereal component, pizza, and quiche.

The amount exported to Canada has steadily increased. In 1983, this amount was 2,460 MT, 39% of U.S. exports (Figure 10). In 1990, this amount was 3,862 MT, 41% of U.S. exports; and in 1991, it was 6,478 MT, 49% of U.S. exports (Figures 9 and 10). A significant growth market during this time has been the EC, whose share has increased from 9 to 19% (Figure 10). Other growing markets include Asia, Mexico, and the Middle East (Table 5). Exports to the Caribbean varied over this time period. From 1983 to 1985 its average imports were 665 MT; from 1986 to 1989, the average was 783 MT; and in 1990 and 1991, the average was 569 MT, an overall decline of 13%. Its share of total U.S. snack exports has dropped from 11% to 5% (Figure 10).

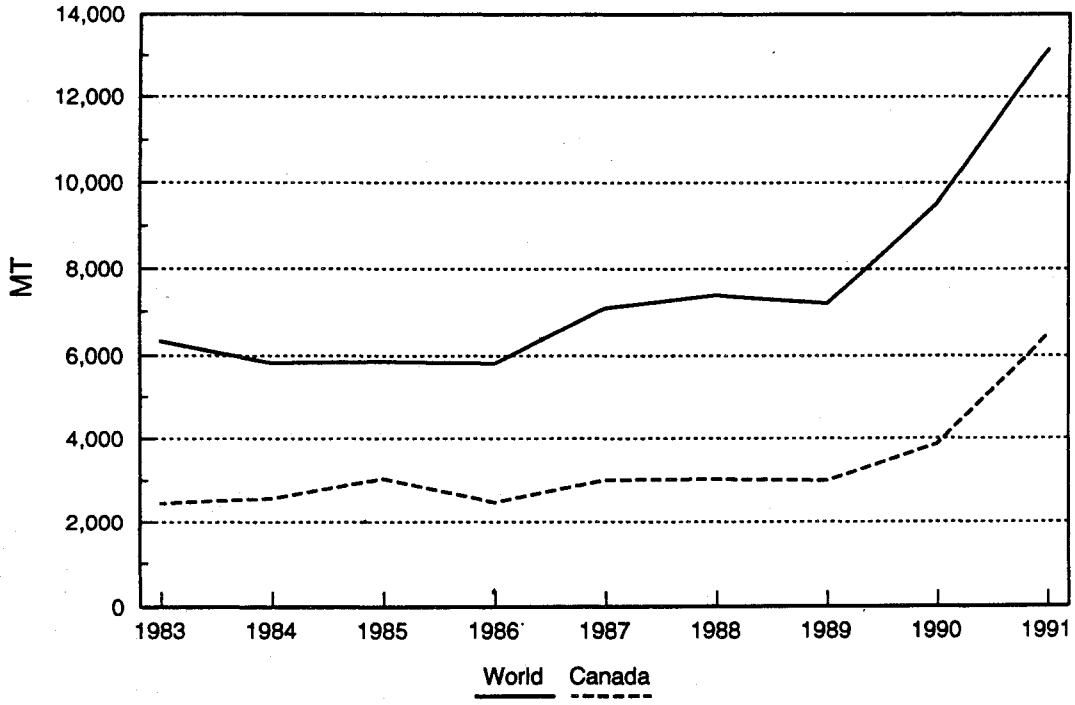

Figure 9. U.S. Exports of Snack Products to the World and to Canada, 1983 Through 1991

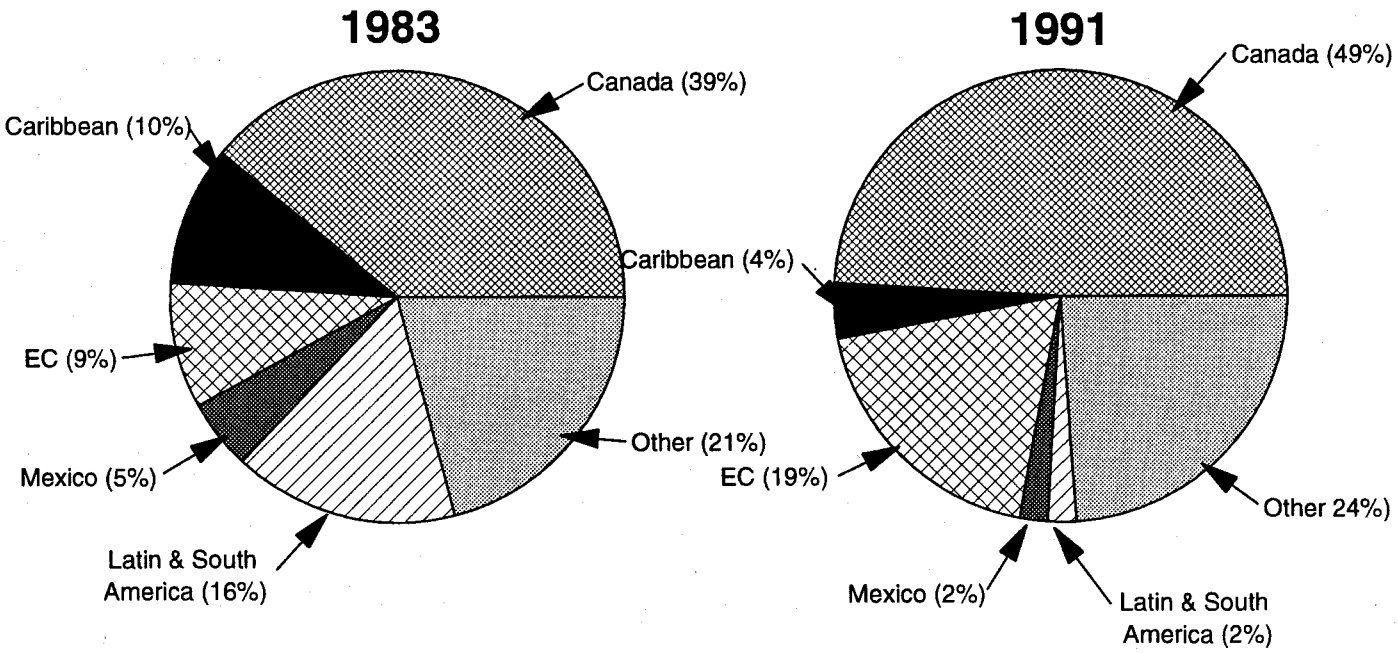

Figure 10. U.S. Snack Exports, 1983 and 1991, by Percent to Country/Region

Contributing Factors

Several factors contribute to increased U.S. exports of highly processed wheat products. Included among these are growing incomes worldwide, changing household and work force compositions, changing diets, increasing urbanization, and technological improvements in logistics and marketing. Trade policies, foreign competition, and differing firm strategies also affect U.S. exports. Also, many U.S. food products must be reformulated, packaged, and labeled according to preferences and regulations in the importing country before they are successfully marketed globally.

Demographics and Changing Diets

As per capita incomes increase, populations satiate their desire and need for calories. They first seek greater variety in their diet, including increased protein and substitution of wheat products for coarse grains. Later, they seek added services, such as convenience, in their food purchases (Lindsey et al., 1993). Halliburton (1992) and Woolsey (1992) cite examples of Asian markets seeking greater variety and increasing their consumption of value-added foods. Globalization of diets may be occurring as the dynamics of these forces change markets (Levitt, 1983).

The countries and regions covered in this paper are highly diverse. Canada, Japan, and the EC are highly developed markets. The average Gross National Product per capita (GNP/cap) of these countries was $20,804 in 1990 (Table 6). This group has the highest daily per capita calorie and protein intake (Table 6). Many of the changes linked to increased purchases of highly processed goods, such as satiation of caloric intake, adequate protein and variety in the diet, women in the labor force, and decreasing household size, have already occurred.

Hong Kong and Singapore occupy a unique niche. They are 94% and 100% urbanized, respectively, and had an average GNP/cap in 1990 of $11,325, which increased rapidly in the late 1980s (Tables 6 and 7). These two countries are entry ports for U.S. exports going to other countries in Asia, such as China, Indonesia, and Malaysia. Thus, exports to these countries may also depend on other countries' demographic factors (Hickok and Orr, 1989-90).

The real GNP/cap increased rapidly in Indonesia, Malaysia, Thailand, and South Korea in the late 1980s (Table 7), although all have lower GNP/cap than other countries discussed. The Philippines also has had an increase in real GNP/cap, although not as rapidly. On average, this group has had significant increases in daily caloric and protein intake. Although these countries are less urbanized, they had the greatest increases in urbanization during the 1980s.

The remaining three countries/regions: Mexico, Saudi Arabia, and the Caribbean, are unique. The Caribbean, for example, has great diversity in the size and wealth of individual islands and is largely influenced by tourism. However, the Caribbean shares common characteristics with other developing countries, such as increased daily per capita caloric and protein intake and increased urbanization (Table 7). The real GNP/cap for Mexico and Saudi Arabia have decreased slightly (Table 7). Mexico shows relatively no change in caloric or protein intake, although its caloric intake is high at 3,052 calories per capita per day. Saudi Arabia has shown large increases in caloric and protein intake. Both are increasing in urbanization.

Table 6. Selected Demographic Factors for Importing Countries and Regions, 1990

Country/ Region	GNP	Urban	Daily Calories	Daily[1] Protein
	($ U.S.)	(%)		(gr)
Canada	20,370	77	3482	102
Caribbean Average	4,645	49	2664	73
Mexico	2,490	73	3052	79
Asia[2]				
Hong Kong	11,490	94	2853	85
Indonesia	570	31	2750	60
Japan	25,890	77	2956	96
S. Korea	5,400	72	2823	81
Malaysia	2,320	43	2774	58
Philipp.	730	43	2375	54
Singapore	11,160	100	3198	89
Thailand	1,420	23	2316	49
EC[3]				
France	19,520	74	3465	113
U.K.	16,060	89	3149	89
Ave.EC-12	16,152	75	3509	105
Middle East[4]				
S. Arabia	7,060	77	2874	86
U.S.[5]	21,790	75	3671	111

[1]GNP, daily calories, and daily protein are per capita.
[2]Insufficient information is available on Taiwan to include.
[3]France and the U. K., selected for illustration, are two of the largest importers of U.S. wheat products in the EC.
[4]S. Arabia purchases approximately 80% of U.S. exports of wheat products to the Middle East.
[5]The U.S. is included for comparison.

Two factors of considerable importance in the purchases of highly processed foods are female participation in the labor force and household composition. Data were insufficient for inclusion in tables. However, general trends are toward increasing participation of women in the labor force and declining household size. While the U.S., Canada, and many European countries saw large changes in these two factors in the 1970s and 1980s, many developing countries are just beginning to exhibit similar trends. For example, in the Caribbean and Mexico there has been a steady increase in the participation of women in the labor force with 8% and 6% increases, respectively, during the 1980s (IBRD, 1991-92). Female participation in the work force in Japan, Korea, and Hong Kong is estimated in the range of 40 to 60% (Nielson et al., 1990).

Table 7. Growth Rates in Selected Demographic Factors for Importing Countries and Regions, 1980s

Country/ Region	Real Growth GNP/yr. (1985-90)	Change in Urban (1980-90)	Change in Daily Cal. (1980-90)	Change in[1] Daily Prot. (1980-90)
	percent			
Canada	1.8	1	6.0	6.0
Caribbean Average	2.8	10	5.9	7.4
Mexico	(0.2)	3	0.8	(0.1)
Asia[2]				
Hong Kong	7.1	2	6.5	0.8
Indonesia	5.7	9	14.7	19.1
Japan	4.6	1	4.9	9.7
S. Korea	12.1	15	4.7	6.9
Malaysia	5.3	8	2.1	0.7
Philipp.	2.9	8	(1.9)	0.0
Singapore	6.2	0	(4.2)	(2.4)
Thailand	10.2	6	0.7	3.5
EC[3]				
France	2.6	1	0.1	3.1
U.K.	2.9	0	0.0	1.3
Ave.EC-12	3.1	3	3.2	5.9
Middle East[4]				
S. Arabia	(0.5)	10	3.3	11.6
U.S.[5]	2.1	1	4.9	7.5

[1]Cal. is calories and Prot. is protein. GNP, daily calories, and daily protein are per capita.
[2]Insufficient information is available on Taiwan to include.
[3]France and the U. K., selected for illustration, are two of the largest importers of U.S. wheat products in the EC.
[4]4Saudi Arabia purchases approximately 80% of U.S. exports of wheat products to the Middle East.
[5]The U.S. is included for comparison.

Competition and Trade Policy

The U.S. is a relatively minor exporter in the world market for many high-value products, including those presented here. For example, between 1983 and 1991, the U.S. world share in bakery products was estimated at about 2 to 5% (St. Clair, 1992). The U.S. share of the world trade in breakfast cereals was estimated at about 17% in 1990 (Dwyer, 1991).

The largest exporter of high-value and highly processed products is the EC. Approximately 77% of the EC's agricultural product exports are high-value (Elleson, 1990). Of the EC's high-value exports, an estimated 64% are highly processed (Elleson, 1990). The EC is the largest competitor for the United States in the export of highly processed wheat products. For example, the EC has approximately a 30% share and a 50% share in the Canadian and the Caribbean bakery import markets, respectively. An exception is the Asian markets where competition is largely from other Asian countries and Australia (Dwyer, 1991; Goldstein, 1988; St. Clair, 1992).

Several aggregate trade and agricultural policies impact product trade and competition. The pending North American Free Trade Agreement (NAFTA) and GATT agreement will potentially impact export quantities as well as the distribution of exports between commodities and products. The U.S./Canada Free Trade Agreement (CUSTA) reduced tariffs on products from 10% over a five year period, which could be one factor in the increased exports to Canada.

More importantly, however, before 1989 Canada operated under a two-price system on wheat. Thus, during much of the 1980s Canadian domestic wheat prices exceeded those in the United States, thereby increasing ingredient costs for Canadian food manufacturers. In 1989, a North American wheat price was defined (in relation to the Minneapolis Grain Exchange price), which applies to all sales to domestic processors. In concept, this should eliminate this source of competitive disadvantage for Canadian produced value-added wheat products.

During the time period reported in this paper, there were import licenses on wheat exported to Mexico that were restrictive. However, products were allowed to move freely at tariffs of typically 10%. This favored product trade relative to local processing. Under the NAFTA, tariffs on wheat and products, each to be reduced over time, will replace licenses.

Other trade polices that impact high-value trade include the EC's restitutions on flour, and subsidies for processed wheat products, i.e., restitutions in proportion to the flour components of products (the so called *value-added regime*). This has resulted in the growth in EC flour exports during the past decade. In addition, this may be part of the reason for the expansion and growing dominance of EC product exports. As an example, EC pasta exports have increased resulting in a controversy between the U.S. and EC in pasta trade (*Milling and Baking News,* January 12, 1993). U.S. pasta exports to the Middle East have nearly disappeared since 1983 (Table 4).

The U.S. Export Enhancement Program (EEP) was originally conceived to enhance exports of products as well as commodities. However, the program has focused on commodities. While EEP has been used to some extent on flour and semolina, no other assistance has been provided for wheat product exports. An important side effect of the EEP program is that it results in higher domestic prices for processors, thereby favoring non-U.S. processing.

In most importing countries, the level of protection of products generally increases as the level of processing increases (Harrison, 1992). For illustration, the average *ad valorem* tariffs on wheat, flour, and highly processed wheat products to Japan are 20, 18.9, and 28.5%, respectively. Similar tariff structures exist for Korea, Indonesia, Malaysia, Philippines, Taiwan, and Thailand (Garner and Winton, 1992).

Firm Strategies

Commodity trade will continue to dominate wheat product exports from the United States for a number of reasons. In most cases, logistics favor commodity trade and shipments. However, commodity trade is subject to limited growth, intercountry and interfirm competition, and political intervention. More importantly, food processing firms face limited growth in the U.S. domestic market; thus, growth must necessarily come from the international market.

In many markets, the entry mode for U.S. firms may be through investment, joint ventures, acquisitions, partnerships, or licensing rather than through direct exports. Of the 45 such interfirm arrangements listed in *Milling and Baking News* since 1990, eight involved U.S. firms expanding overseas; five involved non-U.S. firms only; and two involved overseas firms entry into the U.S. Examples include Kellogg's investment in a breakfast cereal plant in India (Liesse, 1991); a joint venture between Sara Lee and Grupo Industrial Bimbo for product distribution in Mexico (*Milling and Baking News*, December 8, 1992); and Cereal Partners Worldwide's (General Mills and Nestle) investment ($45.6) in a cereal plant in Mexico (*Milling and Baking News*, April 20, 1993).

Competition also comes from importing countries as their food processing sector develops. Examples of this can be seen in Asia where the processing industry is growing fast, including a boom in instant noodles and bakery products (Goldstein, 1988). U.S. bakery exports to Japan increased over 1,000% between 1983 and 1989 before falling 68% by 1991 (U.S. Bureau of Census data). This is largely attributable to the development of Japan's baking industry (Huthoefer, 1992).

Summary

U.S. exports of highly processed wheat products have increased in quantity exported, ranging from a 108% increase for snack products to a 298% increase for breakfast cereals, since 1983. Canada is the largest market for U.S. highly processed wheat products. The percent of U.S. exports of bakery products, breakfast cereals, pasta, and snacks exported to Canada were 65%, 42%, 84%, and 49%, respectively, in 1991. Canada, the Caribbean, Mexico, and Latin and South America have combined shares of U.S. exports that range from 57% in snack products to 92% in pasta products. Canada, Mexico, the EC, and Asia have all had above average growth in their imports of one or more of these U.S. wheat products.

Many factors contribute to the increased U.S. exports of highly processed wheat products, including worldwide income growth, changing household and work force compositions, increased urbanization, changing diets and trade policies, and technological improvements in logistics and marketing. The largest and/or fastest growing markets for U.S. wheat product exports may change in the future. Many countries in Asia, Eastern Europe, and Latin and South America are just beginning to exhibit the characteristics that affect the consumption of highly processed foods. Further analysis of stages of development and imports of U.S. wheat products could be used to predict future markets for U.S. wheat product exports.

End Notes

1. High value products include all agricultural exports other than raw commodities. This includes products often defined as intermediate and semi-processed, such as meat, flour, and vegetable oil; high value but unprocessed products, such as fruit, vegetables, and nuts; and highly processed products, such as beverages, chocolates, and breakfast cereals (Elleson, 1990; MacDonald, 1991).

2. Other products that contain a wheat component are not presented here (see footnote 4). However, the illustration remains unchanged.

3. This is a ten digit coding system for identifying exports. Prior to 1989, a seven digit system was used for reporting exports. To provide data continuity, the Bureau of Census estimated all exports from 1983 to 1989, originally reported in the seven digit system, in the nomenclature of the harmonized ten digit system. While this provides data continuity, these data are estimated. Since we will be discussing categories such as pasta or bakery that are the sums of individually coded subcategories, this is not a problem.

4. Depending on the source of data used categories, such as bakery products, pasta, breakfast cereals, and snacks, are defined differently. For example, the *U.S. Industry Outlook* published by the Department of Commerce reports bakery products according to their classification in the Standard Industrial Classification and selects the exports to match these categories. Therefore, their definition of bakery products includes several categories (e.g. frozen dough, pizza) that are classified differently in the U.S. Bureau of Census export data.

   Most world trade data quoted are reported by the Food and Agricultural Organization of the United Nations, which uses the Standard International Trade Classification.

   Since we analyze U.S. trade data, we chose to use export data as reported by the Bureau of Census as closely as possible to their coded entries.

5. A category of potential interest, but not reported here, is food preparations. We have chosen to include only items that are highly processed. Food preparations includes infant preparations, wheat flour blends, mixes and doughs, and many items that do not contain a wheat component. Growth in these categories has shown similar patterns to those categories reported.

6. All values reported are nominal. In all categories except pasta real growth in value exceeded growth in quantity exported.

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Appendix I. Harmonized Codes of Wheat Product Exports Included in Each Category.

Pasta

1902	Pasta
1902112000	Pasta w. egg, uncooked, not stuffed
1902114000	Pasta w. egg, nesoi
1902192000	Pasta w/o. egg, uncooked
1902194000	Pasta w/o. egg, nesoi
19022000 (20,40,60)	Stuffed pasta
19023000 (20,40,60)	Other pasta
1902400000	Couscous

Breakfast Cereals

1904	Cereals (Prep. by swelling/roasting of)
1904100000	Prepared by the swelling or roasting of cereals, etc.
19049000 (20,40)	Other

Bakery

1905	Breads, pastries, cakes, etc.
1905100000	Crispbread
1905200000	Gingerbread
19053000 (20,40)	Sweet biscuits, etc.
1905400000	Rusks, toasted bread, etc.
19059010 (40,60)	Bread, pastries, cakes, etc.

Snacks

19059090 (30,60,)	Other (cereal based chips, pizza, quiche)

Appendix II. Definitions of Regions

Asia: Hong Kong, Indonesia, Japan, South Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand

Caribbean: Anguilla, Antigua and Barbuda, Aruba, Bahamas, Bermuda, British Virgin Islands, Cayman Islands, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Netherland Antilles, St. Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Trinidad and Tobago, Turks and Caicos Islands

Middle East: Bahrain, Cyprus, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, Turkey, United Arab Emirate, Yemen

Latin American and South America:

Argentina, Belize, Bolivia, Brazil, Chile, Columbia, Costa Rica, Ecuador, El Salvador, French Guinea, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Uruguay, and Venezuela

European Community:

Belgium, Luxembourg, Denmark, France, Germany, Greece, Italy, Ireland, Netherlands, Spain, Portugal, and the United Kingdom