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Potatoes: changing production, changing consumption

By Barbara McLaughlin

Whether they're mashed, scalloped or french fried, potatoes have always been an important part of Canadians' diets. In fact, they're our favourite vegetable.

In 2003, each Canadian consumed on average 113 kilograms of vegetables. About 30% of this consumption was potatoes, well ahead of the next most popular veggies: lettuce, carrots, onions and tomatoes.

About half of Canada's potato production goes to the fresh market and half to making processed foods such as fries and hash browns, potato chips and other potato products such as potato starch.

Overall, consumption of fresh potatoes has been showing a gradual, but steady decline. Consumption of frozen potato products, mainly french fries, is also going down. On the other hand, Canadians are eating more other processed potato products, such as pressed potato chips and dehydrated products.

The demand for potatoes may be declining because of various diets as well as consumer perceptions about its nutritional value. However, the fact is that they are a healthy food product.

Vista on the Agri-Food Industry and the Farm Community contains articles highlighting statistical insights on themes relating to agriculture, food and environmental issues.

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Symbols

The following standard symbols are used in Statistics Canada publications :

.	not available for any reference period
-	not available for a specific reference period
...	not applicable
P	preliminary
r	revised
x	confidential
A	excellent
B	very good
C	good
D	acceptable
E	use with caution
F	too unreliable to be published

Potato production is also a key segment of Canada's agriculture industry. In 2003, Canadian potato growers produced a record crop of 5.3 million tonnes worth \$882.6 million.

Canadian growers have also opened up an extensive export market for certain processed potato products such as french fries. In 2004, this export market, mainly south of the border, was worth \$902 million.

The industry has also undergone a huge transformation within Canada. Farmers in Prince Edward Island still lead the pack when it comes to growing spuds. However, since the 1990s, more and more production has headed west into the Prairies. In terms of acreage grown, growers in Manitoba have taken over the number two spot from those in New Brunswick.

This paper examines the history of the potato, and identifies the shifts in markets that have caused these changes. It also introduces data from a new experimental series on per capita consumption of potatoes in terms of fresh, frozen, chips and other products at the fresh equivalent, retail and consumer levels.

Potatoes indigenous to South America

Potatoes are indigenous to South America, where wild potatoes were a food staple of the Incas for thousands of years and cultivated for centuries. These ancestors of the product we know today are smaller than today's varieties. Their colors were the hues of the rainbow, even a blue black.

Potatoes could survive the colder temperatures of the mountain areas, and

were easy to cultivate, very nutritious and easy to store. They also were the original freeze-dried food. Peruvians would leave them on the ground to freeze. The next morning they would tramp the potatoes to remove the moisture. This would be repeated for four or five nights until all that remained was white potato flour called *chuño*.

Spaniards introduced the potato to Europe about 400 years ago. Because potatoes were not mentioned in the Bible, and because they resembled their cousin, the deadly nightshade plant, there was initially a strong resistance to the tubers. Farmers were forced, and sometimes tricked, into planting potatoes by officials who recognized the potential of the crop to feed the masses.

It was the Irish who took on the crop as their own, a development which had the unexpected role of helping to shape the demographics of North America. In 1845 and 1846, and again in 1848, Ireland was struck with the Irish potato famine when blight destroyed the potato crop. About one million people died from hunger or disease, and another million people left the country, mainly to travel to the new world.

Potato industry has undergone huge transformation

In the last 100 years, the potato industry in Canada has undergone a huge transformation. The 1891 Census found 450,190 acres of potatoes, mainly for consumption by the farm family and for livestock feed.

At the end of the First World War, acreage peaked at 818,800 acres as Canadians helped feed the Allied effort in Europe. Acreage then fell slowly until the 1970s. During that time, potatoes were sold predominately as fresh produce to consumers.

In 1972, potato acreage stood at its lowest level since the 1800s, about 243,000 acres on about 12,400 farms. Potatoes accounted for less than 4% of farm crop receipts in 1972, although they accounted for 73% of crop receipts for Prince Edward Island farmers and 69% of New Brunswick's.

The average farm producing potatoes for sale reported roughly 22 acres of potatoes in 1972. The industry focused on the production of fresh table stock potatoes with lesser amounts going for seed, potato chips and starch. The average yield that year was 180.9 hundredweights (cwt) per acre.

During the next 20 years to the early 1990s, acreage remained somewhat stable. To meet the demands of a growing population for potatoes, farmers improved yields through better growing techniques, higher yielding varieties and irrigation.

But that changed in the early 1990s as Canada began to dramatically increase exports of frozen potato products around the world. Farmers increased their acreage to meet this demand as well as the demand for seed potatoes. Yet, the demand for table potatoes remained somewhat constant.

Acreage continued to expand until excellent growing conditions in 2003 produced a record yield of 260.5 cwt per acre. This yield, combined with the highest acreage in 60 years, resulted in the largest potato crop in Canadian history.

In 2004, producers responded by cutting their area planted in potatoes, the first decline in 15 years. However, even with a reduced area, they produced their second bumper crop in as many years. For the second year in a row, the yield record was smashed, jumping by 10 hundredweights per acre to 270.5 cwt.

Taking on an export market

In 1988, Canada exported 78 million kilograms (kg) of frozen potato products, predominately french fries, mainly to the United States. They had a value of slightly over \$58 million.

Since then, each successive year the export market expanded to the point that by 2004, Canada had exported 1,043 million kg of frozen potato products worth \$902 million.

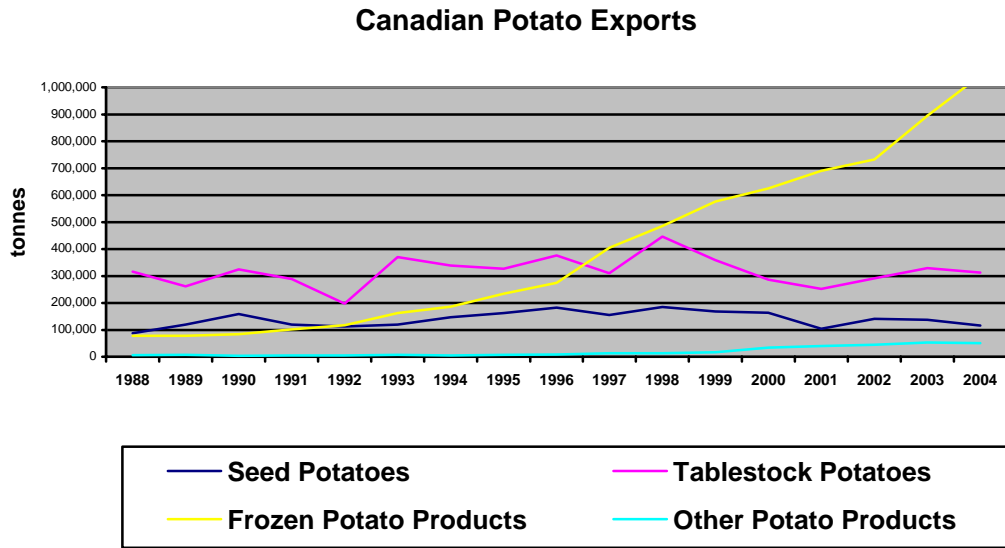
Added to this are sales of potato chips, flakes, granules, pellets and starch, as well as the traditional table stock and seed potatoes. To meet this demand, Canadian potato producers responded by increasing their potato acreage to more than 400,000 acres.

To put it in perspective, Figure 1 shows the export of Canadian potatoes and potato products since 1988. The significance of the increase in processed product is magnified when one considers that it takes about 2 kg of raw potatoes to produce a kilogram of frozen product, and up to 9 kg of raw product to produce potato products such as dehydrated potatoes or starch.

This means that in 2004, almost 1.9 million tonnes of raw potatoes were needed to meet the export demand of frozen potato products. That's the equivalent of 37% of the production. In 2004 for the first time, just over one-half (51%) of Canada's total potato crop was exported.

The majority of exports head to the United States, although product is exported around the world. Figure 2 is the breakdown of exports of frozen french fries in 2003. About 85% of product is exported to North American destinations.

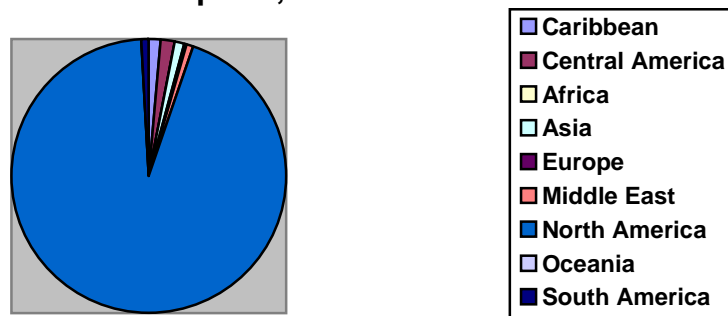
Figure 1



Source: Statistics Canada, Canadian International Merchandise Trade database, International Trade Division

Figure 2

Percentage of Canadian Frozen French Fry Exports, 2003



Source: Statistics Canada, Canadian International Merchandise Trade database, International Trade Division

Shift west

Canadian farmers responded to the demand for frozen potato products by changing the basic structure of the industry. Average potato acreage per farm increased five-fold from 1971 to 2001, and production shifted west.

In 1971, 26% of Canada's potato land was located west of the Ontario-Manitoba boundary. By 2001, 38% of the potato area was in the west.

In 2001, Prince Edward Island growers reported growing nearly 106,900 acres of potatoes. Manitoba growers were in second place, with nearly 77,600, relegating New Brunswick growers to third place with about 58,400.

There are a number of reasons for the shift in production. The west was close to US markets for processed products. Western Canada's land base suited potato production; processing plants liked the availability of land and water for rotation purposes; and the west had the necessary capital in place to invest hundreds of thousands of dollars in specialized machines and storage facilities.

However, it was also the west that took the brunt of the acreage cuts in 2004. Farmers in the Prairies cut their acreage by 8.8% to 174,800 acres, compared to a decline of only 3.0% in eastern Canada, where the acreage hit 257,900.

Are Canadians consuming the perfect potato?

Potato advocates claim they are almost a perfect food. An average serving of a baked potato of about 150 grams provides zero fat, cholesterol or salt, and only 100 calories.

But this serving can provide 45% of a person's daily requirement of vitamin C, 10% of B6, 21% of potassium and 12% of dietary fiber requirements.

They are also a valuable source of essential amino acids. Combined with whole milk, they would meet almost all of the body's daily requirements.

Yet enough fresh potatoes to serve a family of four every night for a week for supper, whether baked, boiled, scalloped or whipped can often be purchased for less than \$5.

So are Canadians consuming their potatoes?

Table 1 contains new, experimental data showing per capita consumption in fresh equivalents or farm weight for the 16-year period between 1988 and 2003. Data show the consumption of potatoes and potato products peaked in the late 1990s.

Since then, consumption of fresh potatoes has been showing a gradual, but steady decline as has consumption of frozen potato products, mainly french fries. However, consumption of other processed potato products, such as pressed potato chips and dehydrated product, is increasing.

The data in the table may appear high. However, it must be noted that all figures for consumption are in the equivalent weight of fresh potatoes used to make a processed product.

For example, a potato is about 80% water. Much of that water has to be removed to make a potato chip. It takes about 2.5 kg of potatoes to make a kilogram of potato chips, or 7 kilograms of potatoes to make a kilogram of dehydrated product.

Table 1

Canadian Per Capita Consumption of Potatoes and Potato Products – in fresh equivalent or farm weight kilograms per person					
	Fresh	Frozen	Chips	All other Processed	Total
1988	34.53	15.48	10.06	7.06	67.13
1989	36.81	15.10	9.73	5.96	67.60
1990	30.88	15.83	9.49	6.74	62.94
1991	32.47	15.86	10.25	6.95	65.54
1992	39.50	15.22	9.95	6.61	71.28
1993	41.57	15.37	10.85	8.10	75.89
1994	42.60	14.96	10.08	8.47	76.12
1995	41.14	14.34	9.71	8.61	73.80
1996	40.59	13.55	10.45	10.50	75.10
1997	42.69	13.69	11.07	10.19	77.64
1998	38.36	13.29	11.15	11.10	73.90
1999	39.61	13.00	11.17	11.99	75.77
2000	36.99	13.50	12.30	12.11	74.90
2001	38.88	13.68	11.89	12.06	76.52
2002	35.32	13.88	11.94	12.33	73.46
2003	34.48	13.51	11.42	13.25	72.67

Source: Canadian Food Stats, *Statistics Canada*
CD no. 23F0001XCB

Note: Totals may not add due to rounding.

There are also estimates that measure the per capita consumption in “retail weight” and “consumed” weights. Retail weight data represent the weight of product sold to consumers. They take into account the weight loss as part of the processing process.

The data for “consumed” product is the retail weight minus the weight of product lost as the food is prepared for cooking. For example, this would represent weight lost when the potato is peeled, as well as the “plate loss”, that is, food put on the plate but not consumed. Table 2 compares the three methods of measuring per capital consumption for 2003.

Table 2

	Canadian per capita consumption of potatoes and potato products – 2003 Kilograms per person per year				
	Fresh	Frozen	Chips	All other Processed	Total
Fresh Equivalent	34.48	13.51	11.42	13.25	72.67
Retail	34.48	7.43	2.86	4.51	49.28
Consumed	18.27	6.61	2.55	4.01	31.44

Source: Canadian Food Stats, *Statistics Canada CD no. 23F0001XCB*

Note: Totals may not add due to rounding.

Americans eat fewer fresh potatoes than we do

Americans eat fewer fresh potatoes than Canadians. In 2003, Americans consumed 21.14 kg of fresh potatoes, in fresh equivalents, well below the average of 34.48 kg per person in Canada.

However, Americans eat on average nearly twice as much frozen potato products as we do: 26.13 kg compared with our 13.51 kg.

For potatoes in all forms, including chips, dehydrated and starch, Americans consumed 62.82 kg compared with our 72.67 kg per person. American consumption peaked in 1996 at 65.77 kg, a year prior to the Canadian peak of 77.64 kg in 1997.

Potato marketing boards are concerned that many popular diets are now scaring consumers away from potatoes. Potato producers are renewing their efforts to promote potatoes as a part of a healthy diet.

Potatoes of the future

The ideal potato is one that will grow faster, mature earlier, yield better and be more pleasing to the consumer's eye. So what's down the road for the spud?

Canadian farmers now cultivate potato varieties that have been developed to produce the perfect potato for various end uses. Specific varieties are grown for boiling or baking, or to produce the ideal golden french fry or crisp potato chip.

United States data has shown that demographics play a significant part in what type of potato people consume, and how much. Producers are working towards educating consumers on how to best prepare various varieties.

Research is also ongoing to develop new varieties that will have even fewer carbohydrates than the current varieties. At the same time, potato marketing boards are putting more dollars into promoting potatoes as a low fat, healthy food choice.