

Cutting Out the Fat.
changing food and agricultural policies,
programs, regulations and pricing mechanisms
to reduce the production, distribution and
consumption of fat in our food system

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This is a work in progress. The Toronto Food Policy Council is interested in discussing the issues and strategies presented here as part of its on-going efforts to improve the food and agriculture system in Canada, and to help create food security. Please forward any comments, and requests for additional copies, to the Toronto Food Policy Council, 277 Victoria St., Room 203, Toronto, ON M5B 1W1. We are grateful to Suzanne Schiller who researched and drafted several sections of this report. Numerous members of the food and agriculture industry provided information and analysis. Ellen Desjardins, Department of Public Health Nutritionist provided data and analyses for the tables.

Foreword

Why is the Toronto Food Policy Council (TFPC) distributing a series of discussion papers on food policy matters?

This Working Paper is written with the purpose of engaging the larger community in the debates around food policy issues. In fact, there are few policies in Canada which clearly bear the label of "food policy". There are, however, several policies which bear upon the food system in Canada, and the health and food security of Toronto residents, visitors, and workers. It is this range of policies which form our interests, and around which we frequently engage in debate.

TFPC members are drawn from several different sectors as well as political orientations. While we can readily agree on shared goals such as alleviating hunger, protecting our economic and environmental base, and valuing our communities and citizenry, we often differ on what we see as the problems and solutions. It is usually only after lengthy reflection and debate that a policy position emerges and strategies for implementation become clear.

Our discussion papers are designed to bring forward the less easily available data on the issues we struggle with. Historical information is often cited so that we can understand intentions and processes of change in the past. We frequently propose long-term solutions that some find difficult to imagine, but we believe strongly that a vision of a better society must be supported with the means for its attainment.

For us the questions of food policy, or policy related to food security, tug at both our minds and our heart. It is in the spirit of broadening the debate and listening to more voices that we are sharing these discussion papers.

Executive Summary

Consuming fat is essential to a healthy diet, yet concern about the amount and type of fat in the Canadian diet continues to grow. Excess fat consumption is linked to a host of diseases including cancer and heart disease. Many health professionals and policy makers have long attempted to reduce the populations' consumption of fat, with some success. Attention has focussed particularly on changes to nutrition labels, and on public education programs. Consumer buying habits have changed over the years, moving away from commodities historically associated with higher fat levels (e.g., whole milk, certain fats and oils, beef and pork), but at the same time increasing their consumption of processed foods in which the fat content may be hidden. Some food producers and manufacturers have adapted to changing demands by producing leaner and reduced-fat products. Other manufacturers, however, continue to produce and sell products that contribute to excessive fat consumption in our diet.

Fat consumption remains above recommended guidelines, and there is little indication that population averages will fall rapidly in the short term. We believe that current approaches, rooted primarily in individual lifestyle modification strategies, have reached the limits of their success. The reasons for excessive fat consumption are complex, and include such factors as fast-paced yet less physically active lifestyles, 2-person working families, increasing promotion of convenience, the manipulation of consumer taste, loss of food preparation skills and knowledge, and the structure of the food economy. It is particularly on this last factor that we concentrate in the attached discussion paper. We believe that additional reductions in fat consumption will come primarily from systemic changes to the way we produce, process and distribute foods.

The sources of fats and oils in our diet have changed over time. Earlier in this century, consumption of whole foods was a greater percentage of the diet, processing was minimal, and eating out in restaurants was, for most of the population, infrequent. Consequently, consumed fat came from fresh or minimally processed foods. Now, however, more processed foods are the most significant sources of fat. Fats and oils, fresh and processed meats and milk products account for 71.5% of the total. In general, consumption of processed and fried foods contribute more to fat intake / weight of food consumed than do fresh or minimally processed foods. However, certain fresh or minimally processed foods are consumed in excess of what is considered optimal. The Ontario Health Survey reveals that we consume too much meat and insufficient levels of fruits, vegetables and complex carbohydrates.

For most animal products, significant changes have been made to breeding programs, pricing mechanisms and grading systems. In combination, these changes have resulted in lower fat products on the market. For example, beef are leaner, in part because of changes to the beef grading system, creating financial incentives for farmers to produce leaner beef. Similarly, many incentives to dairy fat production have been removed over the past decade, and the dairy subsidy,

designed to make more affordable industrial milk products (cheese, yoghurt, etc) will be eliminated shortly.

Regarding more processed foods, the regulations of the Food and Drugs Act permit many high fat products on the market, in part because of the way foods are defined, in part because of different ways of measuring fat which contribute to consumer confusion about how much fat they are consuming. For example, several prepared meats can be very high in fat, and dairy products are fat labelled in a different manner than the healthy eating guidelines. Manufacturers do have a much greater variety of low-fat items on the market, but these changes have resulted largely from consumer and regulatory pressures. Further changes to the market place will likely result from government policy initiatives that shape market behaviour.

We recommend a three-stage process of transition. Our policy and regulatory apparatus is a product of long-standing beliefs and assumptions. It's structure has been assembled over many years, generally following a pattern of incremental additions, with the overall coherence of the structure rarely assessed. Consequently, we believe that an evolutionary transition to the new approach proposed here is most appropriate.

In this framework, Stage 1 strategies involve making minor changes to existing practices to help create an environment somewhat more conducive to the desired change. The changes would generally fit within current policy making and regulatory activities, and would be the fastest to implement. Second stage strategies focus on the replacement of one practice, characteristic or process by another, or the development of a parallel practice or process in opposition to one identified as inadequate. Finally, third stage strategies take longer to implement and demand fundamental changes in the use of human and physical resources. This final, or redesign stage, is unlikely to be achieved, however, until the first two stages have been attempted. Ideally, strategies should be selected from the first 2 stages for their ability to inform analysts about redesign (the most underdeveloped stage at this point) and to contribute toward a smooth evolution to the redesign stage.

First stage:

1. Make nutrition labels on all processed foods mandatory, and ensure that they contain information on total calories, calories from fat, total fat, saturated fat, cholesterol, and total carbohydrates.
2. Rewrite certain Food And Drugs Act Regulations so that fat production and distribution is discouraged, and consistent labelling of fat content encouraged:
 - a) Change all prepared meat food definitions so that the product can contain no more than

- 25% fat by weight.
 - b) Change dairy product food definitions so that maximum fat contents are specified for each type of cheese.
 - c) Change all product labelling systems so that the label contains both the grams of fat and the percentage of calories consumed as fat (consistent with Canada's Healthy Eating Guidelines)
 - d) Require labelling of all fatty ingredients.
 - e) Require labelling of trans-fatty acids.
3. Healthy Lifestyle Restaurant programs should become part of the Ministry of Health's mandatory program guidelines. Such programs reward restaurants offering a significant number of low-fat menu items with public recognition. They have proved very popular with restaurateurs in municipalities offering them.
4. Educational programs with demonstrated success in reducing consumer consumption of fat should be expanded, including workplace intervention and skills for food shopping programs.

Second stage:

5. Implement strategies to require full consumer information about food:
- a) Labels that tell consumers how their food product complies with the government's healthy eating guidelines (e.g., "Eating this product several times a week is consistent with Canada's Guidelines for Healthy Eating" or something to that effect); this might also be achieved with a colour coding system (e.g., different colours for high, medium and low compliance). Restaurant menus would also be required to provide such colour coding to permit patrons an opportunity to evaluate how the meal they were about to order compared with recommended daily intakes.
 - b) Grading standards based more on nutritional than cosmetic criteria.
 - c) Just as cigarette advertising has been restricted because of the serious health effects of smoking, advertisements for junk food and those advertisements that play on people's concerns about their body image and social acceptance should be eliminated. The body image issue is related to both total dietary intake and fat consumption. Anorexia and bulimia are becoming serious health issues, particularly among teenage women, and fears about obesity are a major source of the problem. Many societal factors contribute to those fears and food advertising is a contributory one.

6. Transition programs (subsidies, tax credits, farm services) to encourage processors to move toward lower fat foods. There are a number of existing programs for food processors, none of which are commodity specific or have nutritional value of the product as a criterion. Just as the dairy subsidy reduced milk costs for processors and dairy product costs for consumers, subsidies or tax credits could be available to processors sourcing lower fat product, and sustaining its low-fat quality through processing.
7. Change taxes on food so that fresh foods are not taxed and processed ones (clearly defined) are. Under current rules, a takeout salad will be taxed, but french fries may not be. Such anomalies should be eliminated, to ensure that purchase of fresh foods are favoured by the tax system.
8. Examine the feasibility of by-laws, zoning restrictions and other measures, similar to those used to restrict access of young people to tobacco, to limit access to high fat and highly processed foods around schools, including restricting the sale of high fat and highly processed "fast" foods in vending machines and stores within close proximity of schools.
9. Under the Food and Drugs Act, require, as the Netherlands has, that the trans-fatty acid content of most margarines be reduced to 1% within 1 year.

Third stage:

10. Develop demand management and supply coordination systems for optimizing the availability and nutritional value of the food supply for all residents.

Fifteen years ago, the Science Council of Canada proposed that Canada move towards an optimal nourishment scenario, but little progress has been made. Other governments have been more successful. In the 1970s, Norway set out to design its food and agriculture production and distribution system to better promote nourishment and adjusted its policies accordingly. By setting goals and establishing appropriate institutional supports, they have been able to change the way the food is produced and distributed. They had four main goals:

- 1) to stimulate the consumption of healthy foodstuffs (for example, grains, potatoes and polyunsaturated fats) and decrease consumption of unhealthy ones (for example, saturated fats, refined sugars) in order to reduce the incidence of some chronic diseases;
- 2) to develop guidelines for food production as recommended by the World Food Council;
- 3) to increase domestic food self-reliance from 39% of total calories to 52% by 1990; and

- 4) to promote regional development.

Various tools have been used to achieve these goals: production and consumer subsidies, marketing promotion based on nutritional quality, consumer education programs, improved labelling systems, and legislation to penalize the production of food and drink detrimental to health. However, the government recognized that taste cannot be legislated, and that the marketplace will still play a central role in food purchasing patterns.

The Norwegian strategy has produced some positive results. Self-sufficiency reached 50% by 1988, and fat as a proportion of energy in the diet dropped from 40% (1975) to 37% (1987), although some undesirable fats have been inadvertently subsidized. Consumption of whole grains, fruit and low-fat milk is up, and potato and grain quality has improved. A decline in cardiovascular deaths has been partly attributed to the Nutrition Policy. Farmers have achieved income parity with industrial workers.

In the context of this paper, the main implications for redesigning the Canadian food and agriculture system to achieve an optimal diet include:

- a) Continuing the shift in emphasis toward animal production systems that reduce carcass fat. This could involve some combination of reducing concentrates in livestock diets (Norway proposed this), lengthening the growing period, and increasing forage intake. Changes of this nature would have substantial implications for management and design of farms, and for land use since many livestock enterprises in Canada are structured around a high concentrate diet and rapid fattening. Many farms rely on purchased feed and have insufficient land to grow their own grains and forages. Manure disposal is an associated problem on such farms.
- b) Focus on fresh food production and minimal processing. Canadians have been consuming more fresh food for some time, and this trend could be supported under an optimal diet scenario. This will require more highly developed regional distribution systems. Some parts of the processing industry would become more seasonal. Certain forms of processing would be discouraged: removal of fibre from grains; bleaching; addition of salt, refined sugar, and food additives; and boiling in fat, oil or water.
- c) Demand/supply coordination where national food demand is determined by what provides for optimal nourishment, then supply is coordinated (somewhat like what happens now with supply managed commodities) to meet that demand; foods that do not comply with this scenario are available but are highly priced to discourage excess consumption.

We believe that the implementation of this agenda will significantly help consumers reduce fat in their diets.

1. Introduction

Consuming fat is essential to a healthy diet, yet concern about the amount and type of fat in the Canadian diet continues to grow. Excess fat consumption is linked to a host of diseases including cancer¹ and heart disease². Many health professionals and policy makers have long attempted to reduce the populations' consumption of fat, with some success. Attention has focussed particularly on changes to nutrition labels, and on public education programs. Consumer buying habits have changed over the years, moving away from commodities historically associated with fat (e.g., whole milk, certain fats and oils, beef and pork), but at the same time increasing their consumption of processed foods in which the fat content may be hidden. Some food producers and manufacturers have adapted to changing demands by producing leaner and reduced-fat products³. Other manufacturers, however, continue to produce and sell products that contribute to excessive fat consumption in our diet.

Fat consumption remains above recommended guidelines, and there is little indication that population averages will fall rapidly in the short term. We believe that current approaches, rooted primarily in individual lifestyle modification strategies, have reached the limits of their success⁴. The reasons for excessive fat consumption are complex, and include such factors as fast-paced lifestyles, 2-person working families, increasing promotion and consumption of convenience and highly processed foods, the manipulation of consumer taste, loss of food preparation skills and knowledge, and the structure of the food economy. It is particularly on this last factor, and the policies, programs and regulations that have influenced it, that we concentrate in this discussion paper.

We believe that additional reductions in both total and undesirable fat⁵ consumption will come primarily from systemic changes to the way we produce, process and distribute foods. It makes little sense to continue to produce and process for market high fat foods if health agencies must then encourage the population not to eat them regularly. It also makes little sense to produce foods that must have their “wholeness” modified - removing fat through processing - in order to make them suitable for the population. This situation is even more bizarre when considering that the production and distribution of high fat foods is still facilitated by government policy, policy that contradicts governments' own health promotion actions.

This report addresses these required policy and regulatory changes. Part 2 provides a brief overview of how fat in our diet has been viewed historically, and how agricultural production and food distribution practices (and associated policies and regulations) evolved in step with such perceptions. Part 3 examines both the necessity and problems of fat consumption, and the health problems associated with excess consumption. In part 4, we review the positive changes that have come about in recent years, changes led by both food producers and manufacturers. In part 5, we examine different commodities and show how policies and regulations and the marketplace continue to contribute to excess consumption of fat. Part 6 contains proposals for change so that health promotion is a

paramount objective. It is our belief that our food system should be producing whole (minimally processed) foods, ones that have not had their fat content increased as a result of breeding requirements, nor require additional fat to make them palatable or marketable.

2. A brief history of our relationship with fats and oils

The sources of fats and oils in our diet have changed over time. Earlier in this century, consumption of whole foods was a greater percentage of the diet, processing was minimal, and eating out in restaurants was, for most of the population, infrequent. Consequently, consumed fat came from fresh or minimally processed foods. Because people were more involved in growing and raising their own food, or because there was more direct purchase with more flexibility, they had more latitude to control their fat intake according to the needs of the family. For example, carcasses could be trimmed to meet family specifications, or milk skimmed in a variety of different ways.

Animals were reared in less intensive production systems, with diets more closely suited to their digestive tracts, and rapid weight gain was not as great a concern as it is today. Consequently, carcasses were generally leaner. Also, animal breeds had not been manipulated to augment the fat content, as happened later with dairying for example.

Humans were also generally more active. Physical labour occupied many more in the workforce that it does today. The so-called “stresses” of modern society were less predominant and more time was devoted to preparing and consuming food.

Oil processing was also very different, and as processing has changed, so have fatty acid molecules. Oils were largely unrefined, produced in cottage industries and distributed and consumed rapidly to avoid rancidity. Starting in the 1920s, industrial heat-producing oil pressing systems replaced cold-pressed small cottage industries. Nutritious, but less stable oils like flaxseed, were replaced by more stable but unnatural oils that fit better into the new industrial processes. Consequently, oils lower in essential fatty acids (and therefore more stable for industrial purposes) became the dominant oils on the market. Hydrogenated and partially hydrogenated oils also came into the market place and now comprise one-third of the edible oil market. Their popularity is related to the greater ease of mass transport of oils in this form, the development of a margarine industry to compete with butter, and the evolution of a prepared foods industry. Many professionals have serious questions about the health value of hydrogenated and partially hydrogenated oils (see discussion below about trans-fatty acids)⁶.

Now, however, processed foods are the most significant sources of fat. Fats and oils, prepared foods, and processed meat, dairy and baked goods account for 71.5% of the total (Table 1⁷). In general, consumption of processed and fried foods contributes more to fat intake / weight of food consumed than do fresh or minimally processed foods. However, certain fresh or minimally processed foods are

consumed in excess of what is considered optimal. The Ontario Health Survey reveals that we consume too much meat and insufficient levels of fruits, vegetables and complex carbohydrates⁸.

Society's perceptions of fat and its role in healthy human development has also changed. Body fat has long been⁹ a sign of power, health, wealth and reproduction. These perceptions have been a product of both biological survival and culture. As social institutions emerged, these values about fat became incorporated into their frameworks and policies. For example, as the field of medicine evolved, many believed that, because fat is a storehouse of energy, consuming fat was important for sustaining energy during disease¹⁰. With the development of more modern medical interventions, however, this view became less popular. Social norms about fat also changed, starting in North America in the early part of this century¹¹. Awareness of the connections between fat, obesity and mortality factors emerged in the early 1900s¹². For the past few decades, health professionals have encouraged most people to reduce fat consumption, the changes in part reflected in the regular revisions to Canada's Food Guide¹³.

The other significant change, of course, is that people were in the past generally also more physically active, as the demands of daily work and life required greater physical exertion. In an age of sedentary lifestyles, health officials have encouraged physical activity, in combination with nutrition promotion, to address problems of obesity. All of these interventions are altering people's perceptions of, if not actions to reduce, fat consumption.

3. The double-edged sword: the pros and cons of fat

3.1 Benefits of fat

Fat is essential for many body processes, most importantly the construction and maintenance of cells. Canada's Healthy Eating Guidelines recommend we consume no more than 30% of our energy from fat¹⁴. As well as limiting our intake, we are advised to favour certain kinds of fats over others. There are three major kinds of fat: saturated, monounsaturated, and polyunsaturated. Saturated fats tend to raise Low-density lipoprotein (LDL) blood cholesterol, the other two tend to lower it, so we are generally advised to favour the latter two. Many foods contain many of all three categories of fat, but saturated fats come mostly from animal products, palm and coconut oil. Monounsaturates predominate in avocados, cashews, olives and olive oil, peanuts, peanut butter, and peanut oil. Major sources of polyunsaturates include almonds, corn oil, cottonseed oil, soybean oil, sunflower oil, walnuts, flaxseed oil and canola oil.

3.2 Current problems with type of fat and volume of consumption¹⁵

Unfortunately, the average Canadian consumes too much fat for optimal health: 38% of energy intake as fat¹⁶. The Ontario Health Survey (OHS) data show that, in all age groups, over 70% of Metro Toronto residents exceed the dietary guideline of 30% energy from fat¹⁷. This problem is compounded by a lack of physical activity in the population. The OHS estimated that only 33% of the population has achieved sufficient levels of physical activity¹⁸.

Excess fat consumption is linked to a number of diseases and conditions¹⁹. Obesity is one such significant problem for Canadians. It occurs when food energy has been consumed in excess of energy expenditure and the surplus is stored as fat²⁰. In 1985, 20% of men and 14% of women aged 20-69 years had a Body Mass Index (BMI) greater than 27, a level associated with increased health risk²¹. In 1990 the levels had increased to 27% for men and 17% for women²². The Ontario Health Survey (OHS) data show that approximately 25% of Metropolitan Toronto residents have BMIs in the at-risk range. Overeating and insufficient physical exercise are two prominent and modifiable factors in creating this condition. As well, diets high in fat and sugar and low in fibre may be more strongly associated with overeating than low-fat, low-sugar, high-fibre diets²³. A number of studies have associated excess weight with hypertension, elevated blood lipids, and diabetes, all of which are major risk factors for cardiovascular disease (CVD), and with some cancers²⁴.

It is now well established that, to decrease risk of heart disease, total fat consumption, including all types of fat, should be lowered. CVD is the leading cause of death in Canada. In Ontario (1991), 17,011 people died of heart disease and 62,746 were hospitalized. Two major risk factors, high blood cholesterol and hypertension, are related to nutrition. High blood cholesterol plays a central role in the development of atherosclerosis and increases the risk of CVD. According to the Ontario Heart Health Survey²⁵, 42% of Ontarians had a total cholesterol level above that considered advisable. Of the many dietary factors related to blood cholesterol and CVD, the strongest and most consistent evidence relates to dietary fat²⁶. Both the amount and the nature of the dietary fat are associated with blood cholesterol levels. Energy imbalance and obesity also increase the risk of CVD, either directly, or through an influence on blood pressure, serum cholesterol, and glucose tolerance, all of which are risk factors for CVD.

Diets high in carbohydrate and in fibre are associated with low incidence of CVD, but this may be due to the low fat content of these same diets. In addition, there is evidence that some types of fibre can reduce blood lipids²⁷. There are reports in the literature that vegan diets (very low fat, high fibre) can actually reverse heart disease²⁸.

Cancer is the second leading cause of death in Canada²⁹. In Ontario, cancers caused 19,930

deaths in 1991, and cancer hospitalizations occurred for 97,110 people³⁰. It has been estimated that 35% of cancer mortality in North America may be related to dietary factors. As with CVD, dietary fat may be associated with the risk of cancers of the breast, colon, prostate, ovary, pancreas, and rectum. Body weight and BMI are positively associated with many cancers, including pancreas, prostate, ovary, endometrial and postmenopausal breast tumours. Salting and curing agents may increase risks of developing mouth, nose, pharynx and stomach cancers. Diets low in fruits and vegetables are linked to many cancer sites³¹. The OHS data show that fibre intake for the average Metro Toronto resident remains well below recommended levels.

High fibre intake may be associated with reduced risks of colon cancer. Vegetarian diets and high consumption of fruit and vegetables, especially dark green leafy, yellow and orange types, may protect against many types of cancers³². Over half of Metro Toronto residents, according to the OHS, do not consume the recommended intake of fruits and vegetables.

Thus, excess fat consumption is responsible for avoidable health care costs and deaths. The avoidable health care costs may run into the hundreds of million dollars annually³³.

4. Recent initiatives to respond to society's demand for less fat

Consumer demand for low-fat foods has already resulted in major changes to the way foods are produced. In this section, we outline what actions have been taken.

4.1 Fresh and minimally processed foods

For most animal products, significant changes have been made to breeding programs, pricing mechanisms and grading systems³⁴. In combination, these changes have resulted in lower fat products on the market.

4.1.1 Beef

Cattle today have much higher average weights³⁵, grow faster, and tend to be leaner than in the past³⁶. Factors that influence intramuscular fat (marbling) include genetics, the feeding program, age and sex. The Canadian trend for the last 25 years has been to breed for lower fat animals. To breed for leaner meat, farmers have cross-bred with leaner breeds and also reduced length of time in feedlots. Further reductions in fat would be possible with range feeding because it, along with the right breed, tends to produce leaner beef. However, there is very little range fed beef in Canada because of the winter, and because the cattle tend not to grade as well as feedlot cattle due to lack of tenderness³⁷. Range fed beef can be tender if raised on extremely

lush grass, such as that used in Argentina. These conditions are, unfortunately, more difficult to replicate in Canada, although some organic farmers have been successful.

The grading systems for beef³⁸ (and hogs, and to a lesser extent lamb and veal) have changed over time. In 1972, the use of marbling as an indicator of quality was eliminated. As well, lean carcass content was encouraged by introducing backfat as a measure of leanness. This measure combined with animal weight, was used in a formula to calculate the amount of leanness. In 1992, the grading system was adjusted again and marbling was reintroduced as a quality indicator. The new grading system identified three levels of marbling within the A grade (A,AA,AAA). Carcasses with insufficient fat (exterior or marbling) are graded B. This is because some internal marbling is necessary for high quality beef (tenderness, texture and taste). These three marbling levels correspond to the three lowest levels on the US marbling scale of 10.

The premium paid for lean meats³⁹ in the Canadian grading system is dependent on the meat occupying a certain range of fat content. If meat is too lean or too fat, farmers' prices are discounted. According to the beef industry, this means that producer payment practices do not favour the production of higher fat meat; that, in fact, they are penalized for such production.

At the retail level, there have been changes to trimming practices. In the mid 80's, 1/2 inch of fat was allowed, now reduced to 1/4 inch or less. In moving towards less trim, the retail sector feels they have to charge more per weight of meat because of the extra labour and higher proportion of lean meat content per unit of weight.

There is also a growing market in natural lean beef. The Canadian Light Beef Association was formed in the 80's to market lean beef to: 1) counter declining North American beef sales associated with consumer perception that red meat is an unhealthy food choice; 2) meet the demands of changing eating habits; and 3) increase profits by selling a premium product to a growing market. Its brand name is "natural Light Beef" and the production system eliminates the use of artificial colour, flavour or chemical preservatives. For this reason, it may not be used in processed meat like corned beef, pastrami, salami, hot dogs and bologna. This beef offers potentially higher profit margins for many players.

An exception to this trend lies within a small portion of the white table cloth high quality Canadian restaurant trade. It demands quality which it associates with marbling. In general though, the food service industry is very market driven and, consequently, a lot of low quality meat is being used⁴⁰.

In contrast, there is still a price incentive in the US grading system to produce higher fat meat. US cows have more marbling and external fat, partly because of breeds and partly grading standards. Our exported beef tends to compete with the second grade US, "select". "Choice" is their main grade making up 60-65% of feedlot cattle in the US. Most of the imported meat is USDA "select" which is equivalent to our AA, and some is the lower end of "choice" which is equivalent to our AAA. Canadian retailers legally have to label the grade of beef so they rarely accept "ungraded" beef from US. According to industry sources, in the US, although there have been no major change in grading, the beef is gradually getting leaner.

Ontario is 50% self-sufficient in beef production. Ontario beef producers are primarily producing for the domestic market. But if, by chance, Ontario farmers produces higher fat beef, they may try to export it to the USA. Similarly, if USA farmers produce leaner meat by accident, they may attempt to sell in Canada. In Western Canada some feed lots feed cattle to produce a higher level of marbling due to the American buying influence⁴¹. But Canadian packers place different demands on producers. Once cattle attain a certain marbling level, one that might be desirable in the USA, domestic packers are not interested in buying it. Canadian packers want cattle at a specific time, whereas USA packers want them finished longer. In fact, it is these requirements that make Canadian beef attractive to US packers as Canadian systems produce higher yields of lean meat.

Except for tripartite (federal, provincial, producer) insurance programs like the livestock stabilization program, beef has, historically, been free of direct subsidy at the federal level. A few years ago, because of the free trade ethic of the beef industry, producers voluntarily opted out of government support programs. These have generally been tripartite level insurance programs with producer, federal and provincial governments contributing. However, because premiums are so high in relation to pay out, few participate. Ontario's Red Meat development program has been terminated.

4.1.2 Pork

Changes to the hog grading system have paralleled those of the beef sector, rewarding producers for lean meat. The price is now based on a 100 index value; the higher the index, the leaner the meat (i.e. 109 is quite lean and means that a producer receives 9% more than base price). The industry has also changed its feeding programs so that the animal puts on weight but not fat. Pork does not have marbling like cattle. The bulk of fat on hogs is on the outside of the muscle, so it can be separated easily. If well trimmed, pork has the same fat content as fish and chicken. Pork fat is a valuable ingredient (more so than beef fat) for the processing and cosmetic industry.

Regarding provincial government support, the Ontario Pork Improvement Plan has been eliminated. The National Tripartite Stabilization Program that began in the mid 80s was cancelled last year. It offered payouts when market returns to producers were low. There are now no programs specific to hog production at the federal and provincial levels.

4.1.3 Dairy

Farmers:

Before modern cooling technology, milk was marketed fresh because it was highly perishable. Butter and cream, on the other hand, could be kept longer, and for this reason, in the late 1800's, there was a drive to increase butterfat content to facilitate increased dairy exports. Consequently, farmers bred dairy cattle to increase butterfat content⁴². This genetic focus remained until quite recently.

Because consumers asked for lower fat products and processors complained about the resulting excess fat they could not sell, pricing mechanisms and breeding programs have been changed. Now there are disincentives to produce high butterfat in both the pricing and quota systems. Before 1992, farmers were paid based on butterfat content and their quota was based on volume. Since January 1, 1992, farmers are paid according to a multi-component pricing system. This new pricing system puts less emphasis on fat and more on protein, with the quota based on fat content. All this encourages producers to breed and feed for a more balanced fat/protein ratio, but in a way that actually increases the stress on the animals from feeding more grain and less hay⁴³.

Successful breeding for low butterfat depends on the breed and the feed. Breeding for lower fat places more risks with the farmers, as it takes about three years of breeding to see results in lower fat. Regarding feeding, in general, a higher protein diet, gives lower butterfat milk. Fresh pasture has higher protein and will tend to depress butterfat. As the pasture matures and has less protein, cows will tend to give higher fat milk. But there may be health problems associated with feeding for lower fat milk. More protein in the diet gives lower fat milk, but too much protein can lead to toxicity, and digestive and fertility problems⁴⁴.

According to the Dairy Farmers of Ontario, it is not clear, however, that these changes to pricing mechanisms introduced in 1992 are encouraging all farmers to breed for lower fat. Usually farmers breed for optimal production (cost per unit of milk). On each farm there is an optimal economic level that depends on the breed and feed source available. These factors are stronger determinants of what is optimal than are the pricing mechanisms or consumer demand. Consequently, farmers tend to manage on a volume basis, while taking into account fat levels.

Processors:

Processors have slowly diversified their product offerings to accommodate demand for lower fat. Processors remove butterfat to make skim, 1% or 2% milk. For the processor, milk is a source of raw materials. They take out the fat and then add it back to make different products. What consumers buy has no specific relation to the milk that cows produce. It is the processor that creates a product with a specific level of butterfat based on market demand. Processors have wanted farmers to produce more milk with lower fat because they wished to increase their volume throughput and, hence, profitability. The level of butterfat coming from the farm is very important because they cannot sell it all. Processors prefer milk with lower butterfat and higher protein for these reasons.

In general, lower fat products now have a higher profit margin. Grocery stores usually charge the same price regardless of fat content, which provides an economic incentive for processors to remove fat up to a level at which there remains demand for it. Lower fat products cost less to produce because processors can resell the fat in another product (e.g., skim milk is sold for about the same price as whole milk, and the fat is resold). Cheese is an exception, as higher fat cheese commands a higher price due to the higher cost of ingredients.

4.1.4 Sheep

Although not as significant as developments in beef and pork, there have been some changes to sheep grading. The present voluntary national classification system⁴⁵ is primarily focussed on lean meat yield. It uses a muscling assessment and measures fat tissue depth over the animal's second last rib. The market requirement is 9-14 mm of fat. If the meat is too lean or fat, producers are penalized financially.

In Ontario, sheep are graded in 3 categories: thin, normal, and fat. The Sheep Producers Marketing Board has been running producer seminars for the last 6-8 years on raising animals with the right weight and, as a result, breeding and feeding practices have changed. Lamb meat, unlike beef, is not marbled. Fat bundles surround and cover the carcass, but can be easily trimmed.

Lambs are now the strongest part of the market and a high price can be obtained for both lean or fat lamb. Restaurants often want larger carcasses with fat. Some communities, however, such as the growing Greek and Islamic communities, want small lambs. With current high prices for small lambs, there is little incentive for producers to raise them to one year of age (mutton). The Ontario sheep industry cannot supply current demand so imports are significant, coming from New Zealand, Australia and the USA. Foreign growers often have contractual

arrangements with Canadian plants specifying desired yield and fat levels. Although demand sometimes outstrips supply and causes buyers to be less choosy, lambs that are too fat or thin sometimes are penalized and do result in lower prices. Only when there is a slight price difference favouring fat over lean lamb might there be an incentive for producers to buy thinner animals and fatten them longer.

There are no current direct supports to sheep farmers⁴⁶. The national Tripartite Program for sheep has been cancelled as of 1995. The provincial Red Meats Plan ended in 1992.

4.1.5 Poultry

Fewer changes have taken place with poultry, in part because fat is not seen as a major issue given the meat's leanness. Poultry grading, until recently, had a minimum fat requirement for grade to be issued. This minimum fat requirement, a consumer, provincial, and federal government initiative (not to do with the marketing boards), was brought in because producers, attempting to get chickens to market faster, were producing chickens without enough fat, having poor colour and appearance when sold as a whole bird. Now birds are often sold cut up and the majority of chickens now have more than enough fat, so the minimum fat requirement has been dropped. Processors want to maintain it on a voluntary basis as of April 1, 1995, because they find that the grade tag helps with sales. It also still pertains to turkey however⁴⁷ (see below).

What fat there is on chicken is frequently removed. A study of consumer eating habits and preferences found that 60% of respondents did not eat the skin and have tried to lower their fat intake in the past year. For 70% of home chicken consumption, it is baked, broiled or roasted (as opposed to fried)⁴⁸. Only the size of the bird, not fat content, determines the price.

Fat content could be reduced using different production systems and birds bred for different environments. Free range chickens tend to be leaner⁴⁹. The industry feels, however, that it is very costly to raise birds free range because of predators (high mortality rate among chickens) and our climate. Some organic producers, however, are producing and making a living using combinations of free range and loose housing methods.

4.1.6 Turkey

Turkey has always been a low fat meat option. Farmers are paid based on the size of the live bird⁵⁰. Fat content is not an issue⁵¹. As mentioned above, the minimum fat requirement still exists for turkey. Turkey meat tends to be drier and fat tends to be under the skin not in the meat. Fat content really affects palatability. If the fat is insufficient, the meat looks blue and

consumer purchase is depressed.

4.2 More processed foods

The processing sector has made changes to food offerings and labels, driven by consumer concerns about both the extent of processing and the amount of fat. As a result, there are more low-fat options available in the market place. The industry is also now developing fat replacers, with many of the same taste and cooking characteristics of fat, but fewer calories⁵².

These changes started in North America in the 1960s when some consumers began to express interest in minimally processed foods and nutrition issues. Demand for fresh and natural products remain steady through the 1980s⁵³. Dietary recommendations are believed to have influenced both consumer attitudes and manufacturers food strategies. Introductions of low-fat products have continued to increase, particularly fat-free bakery products, low-fat dairy products, and meat-substitute based products, with a fairly dramatic increase occurring in the late 1980s. Such products comprised about 14% of new introductions in the USA in 1993⁵⁴.

Unfortunately, according to USA data, less than 1% of new introductions achieve significant sales levels, so the number of low-fat introductions that significantly penetrate the market is limited. As well, consumption of certain high fat products continues to rise. In the USA, from 1960-90, potato chip consumption rose 50%, and fat and oil consumption was up 35%⁵⁵.

4.3 Eating out

Canadians currently spend about 31% of their total food dollar eating out, down from a high of 35% a few years ago. Restaurant eating is a reasonably recent phenomenon; just a dozen years ago, only 24% of food dollars were spent in restaurants⁵⁶.

Many restaurants offer foods higher in fat than one might find in a typical home meal. For example, more foods are deep-fried; batter is more frequently used on meat, fish and poultry; desserts are typically richer; cream is more available; more foods are prepared with sauces and more salad dressing is applied to salads. As well, eating out often feels like a "treat" and customers will consequently eat more and richer foods than they would at home.

Some restaurants and governments have moved to change this situation by participating in Healthy Lifestyle and Heart Smart programs. For example, Several Metro Toronto public health units have such programs. The nutrition component of the program requires that award-winning restaurants provide a variety of complex carbohydrates with meals, increased fruit and vegetable choices, low-fat dairy products and creamers, smaller portions of meat and fish,

calorie-reduced dressings, substitutes for french fries, and sauces and creams on the side⁵⁷. Restaurants are publicly acknowledged, with plaques and, in some municipalities, award ceremonies hosted by the Mayor. Consequently, they are popular with restauranters and participation has been high in most municipalities.

5. What remains to be done

As discussed above, significant changes have been made to fresh and minimally processed foods and fat content. Less progress has been made on the processed food side. A main factor slowing change is that processed foods provide greater profitability than raw commodities and minimally processed foods. Canada has the most oligopolistic food economy in the Western world, with manufacturers exerting considerable influence over the workings of the entire system⁵⁸. They are, for example, significant players in the setting of raw commodity prices, and government support programs like crop insurance use processing prices in some commodities to set insurance prices. This economic clout allows firms to control the pace at which they respond to market pressures and to influence the very workings of the market itself⁵⁹ and government economic policy⁶⁰. In our view, this economic power has allowed processors to respond only partially to consumer demand for low-fat products, in a way that deflects attention from the deeper structural changes that are necessary if significant fat reductions are to occur. The focus remains on lifestyle behavioural change / market place strategies, and not systemic approaches to promoting healthy behaviour.

There are signs, however, that consumers are prepared to support more significant system changes. It has been recognized for some time that consumers rate excess fat consumption as a significant health problem. Although relevant Canadian studies are lacking, a Minnesota survey of consumer attitudes to greater intervention to limit fat consumption found widespread support for new policies to regulate high fat food use⁶¹. It is these kinds of changes we propose in this section.

5.1 Changes to policies and regulations

5.1.1 Fresh and minimally processed foods

Government support programs are in transition from a commodity-specific focus to a whole-farm focus. These changes are motivated primarily by federal budget cuts, international trade pressures⁶² and to some degree because support programs have been implicated in the promotion of environmentally-disruptive farming practices⁶³.

Nutritional considerations have not been a factor in these changes. However, as discussed above, they have coincidentally helped to discourage the production of fat. There remain, however, a few problem areas.

a) *Support programs designed to enhance what the market sees as desirable*

A consequence of the redesign of government support programs is that policy makers are removing those instruments that allow them to shape the market place. Although it is true that the old instruments were not always successfully employed⁶⁴, this does not mean that government has no role to play. The new instruments, particularly the export enhancement programs, appear simply to accelerate the development and sale of whatever products the marketplace sees as desirable. The government support programs to the processing sector are not specific about what kinds of processing they wish to encourage. Supports are provided based on the likelihood of the product being successful in the marketplace.

Unfortunately, nutritional considerations are not typically driving forces in the marketplace. Consequently, although some firms are concerned about fat, it is doubtful whether the industry as a whole will move in the direction of lower fat processing unless encouraged to do so. Within the current dominant approach to policy setting, governments are unlikely to provide those encouragements.

b) *Uneven playing fields across support programs*

Historically, the animal sector has been favoured by government support programs over plant production (with the arguable exception of wheat). Although support for animal and plant products is not nearly as unbalanced as in earlier periods, some discrepancies remain. The dairy subsidy is the most visible example of a residual tilt favouring animal over plant production. And the structures of the Gross Revenue Insurance Program (GRIP) and the Net Income Stabilization Account (NISA) are examples of biases towards processed over fresh foods.

Dairy subsidy:

In 1970, the dairy subsidy (or direct payment) was created. It is viewed by the industry as a consumer subsidy on industrial milk, set arbitrarily (and lowered twice) by the federal government⁶⁵. It is paid to farmers on a butterfat basis and covers a (declining) percentage of the cost of producing milk⁶⁶. Theoretically, the subsidy was designed to keep the cost of industrial milk (which goes towards cheese, butter, and all other dairy products excluding fluid milk) lower, thus lowering the price to consumers. If a litre cost the farmer 55 cents to produce, the government paid 5 cents and the consumer paid 50 cents. The subsidy would be passed on to the processor in the form of lower costs and then on to the retailer. The processor would sell to the retailer at a

set price based on the price paid to the farmer. But this lower cost has not always been passed on to the consumer, depending on such factors as retail competition and supply and demand⁶⁷.

This federal program has been reduced from \$100 to 80 million as part of the most recent budget cuts. According to the 1996 federal Liberal budget, this subsidy will be eliminated completely by 2002. The majority of the subsidy goes to Quebec as they have the largest dairy sector.

Virtually all other programs supporting animal production have been eliminated.

Structure of GRIP and NISA:

Most government support to farmers is now provided through the Gross Revenue Insurance Program (GRIP) and the Net Income Stabilization Account (NISA).

GRIP:

In Ontario, the two components of GRIP are: Market Revenue Insurance Program; and the Ontario Crop Insurance Program. The main difference between the two components is that under the Market Revenue program, all eligible crops the producer grows must be insured, whereas under Crop Insurance, crop coverage can be chosen selectively.

Market Revenue Insurance Program:

This is joint federal-provincial program which protects grain farmers against reduced income caused by low market prices on 13 eligible crops (corn, canola, winter wheat, red spring wheat, soybeans, white beans, spring grain, coloured beans, sunflowers, faba beans, triticale, field peas and flax seed).

Ontario Crop Insurance Program:

This joint federal-provincial program provides weather risk insurance on 52 crops (fruits, vegetables, and grains) based on individual average farm yields. Participation is voluntary and the level of crop insurance coverage is based on management practices. There is no obvious bias favouring one production practice over another (organic vs no till vs conventional, for example). The production practice will affect yields, but lower yields does not necessarily mean lower coverage, because coverage levels are chosen

by the producer. The only requirement is a minimum total acreage of 3 acres.

There is however, an unintentional bias against certain practices in the area of price setting. The program sets the insurance price at the processing price (which is usually the lowest price) to avoid moral hazard, i.e., avoid providing an incentive to do something a farmer would otherwise not have done, for example claiming to have an organic crop when it is not. As a hypothetical example, if you are an organic tomato producer, Crop Insurance does not insure you at \$9/lb (the premium price you would receive for organic tomatoes at the retail level) but at \$4/lb (processing price for tomatoes). Producers are not insured on where they sell the product, but on what is in the ground. For this reason, the tender fruit producers want market insurance as current Crop Insurance only offers production insurance. This appears to be a significant bias in favour of conventional crop production and processing. Other evidence of the power of the processing sector is that the provincial marketing boards, which were basically created to limit production and set prices, usually do so in negotiation with processors (their main market).

NISA (Net Income Stabilization Account):

This national income stabilization program covers all general agricultural commodities apart from supply managed ones. Producers of edible horticultural products are eligible to deposit 4.5% of their net sales in their accounts for government matching, while other eligible producers may only deposit 2.5% (percentage varies by province). Also, an additional contribution of 20% of eligible sales may be made by the producer. The reason that edible horticultural producers can deposit 4.5% of their net sales as opposed to 2.5% is because horticultural products have not had safety programs, whereas grains and oilseeds have had the Agricultural Stabilization Act (ASA) and Market Revenue Insurance Program. Horticultural products have not required safety programs because until recently, this sector has been protected by tariff walls - 10-15% tariff on commodities incoming during the season in which they were harvested locally⁶⁸. With the adoption of the Free Trade Agreement (FTA), a 10 year phase out of tariffs began. Now, more US products are imported, horticultural profit margins are being eroded. As producers are not making as much money as before, the 4.5% has been brought in as an adjustment.

Crop insurance, in contrast with whole farm income insurance, tends to encourage specialization. It appears that Canadian programs favour the production of grains and oilseeds for feed and processing, and fruits and vegetables for processing. There is now a movement in Canadian safety net programs away from commodity specific price

support towards whole farm income stabilization (NISA). For example, all the tripartite programs have been eliminated although price stabilization continues for grain as the US and EEC have not removed their support programs skewing international market prices. The reason for this shift is to make programs non-distortive across the agricultural sectors in terms of producer decisions on what to grow. From a trade perspective, the whole farm approach is less likely than commodity specific programs to be subject to countervail action from the US and other countries under GATT. NISA is considered non-distorting because the amount spent is much less than that spent on previous commodity specific programs, and the assistance is spread out over a wide range of commodities. To meet the countervail general availability criteria, we might have to extend NISA to supply managed commodities, but most producers and boards are not interested. Regarding GATT requirements, Canada has gone beyond the minimums set for reductions in domestic support for farming, and for eliminating export subsidies, primarily because of budget concerns. We are just meeting the requirements around reducing tariffs, as there is not a budgetary advantage in eliminating these.

c) *The absence of support for the transition to sustainable agriculture systems*

The need to improve both the environment and the nutritional status of the population intersect in the concept of a sustainable or regional diet⁶⁹. Such a dietary approach attempts to optimize both nourishment and the consumption of foods produced in the most environmentally sustainable fashion, emphasizing particularly consumption of minimally processed, locally produced, in-season and organic foods. There is also a focus on eating "low on the food chain", meaning that plant foods are emphasized over animal products, which in most conventional farming systems are generally energy inefficient⁷⁰. Such diets are linked with increased consumption of complex carbohydrates, fruits and vegetables and reduced consumption of fat and animal products. Such diets are, in turn, linked with reduced levels of chronic diseases, such as cardiovascular disease and cancers.

As discussed in sections above, some production regimes are consistent with a sustainability framework. Cattle production systems that reduce consumption of concentrated grains, and loose housing and free range fowl production systems tend to be less environmentally damaging than the dominant approaches. However, there is currently little explicit policy support for the transition to truly sustainable production systems⁷¹. Instead, government programs have concentrated on initiatives related to the early stages of transition: more efficient application of fertilizers and pesticides, changes to tillage practices, some improvements in crop rotations, and early stage Integrated

Pest Management practices. The farm community has made significant progress in these areas as a result, but more substantial redesign of farming practices has only been achieved in limited cases, and usually as a result of the commitment of the individual, not support from the policy system.

Because environmental improvement can be linked to positive changes in diet, an opportunity to promote more nourishing diets is lost when environmental sustainability is insufficiently supported by the policy making system. We make a number of suggestions for improving this situation at the end of this report.

5.1.2 More processed foods

Regulations encourage fat consumption by means of foods definitions and labels. On the positive side, these regulations have effectively guided food manufacturers regarding processing and labelling, have helped ensure a safe food supply, and have limited cases of food adulteration and fraud. In fact, our regulatory approaches emerged primarily for concerns about adulteration⁷². They were not designed, however, with health promotion as a central feature, understandably given that consumer health at the time of adoption was framed by traditional ideas of food safety. Today our understanding of nutrition and food quality is much broader, an understanding that is not reflected in the regulations. In this section we provide some examples of how some federal and provincial regulations are inhibiting the movement to lower fat food consumption by allowing high fat foods on the market and by contributing to consumer confusion about how much fat they are consuming.

(a) Food and Drugs Act and Regulations

The Food and Drugs Act⁷³ is one of the central pieces of legislation (and associated regulations) governing the way food is manufactured and labelled. It provides definitions for foods and rules for labelling. Many foods are defined by their fat content, but the way fat content is defined varies across products, and none of the definitions are easily related to Canada's Healthy Eating Guidelines. The Healthy Eating Guidelines are specific regarding the serving sizes and number of servings of different foods, and the percentage of calories from fat in the whole average diet (i.e., 30%). The guidelines also provide the general statement "choose lower fat foods more often". Given that consumers look increasingly to the Healthy Eating Guidelines⁷⁴ for guidance, the regulations should make it easier for manufacturers and consumers to behave in manners consistent with them. Labelling rules are similarly inconsistent.

Food definitions

Prepared meats

Ground and prepared meats are defined in the regulations by a number of factors, including maximum percentages of fat by weight. Unfortunately, the upper limits allow very high fat meat products on the market. For example, ground beef can contain up to 30% fat by weight (73% calories from fat⁷⁵). Ground pork, with or without filler, can contain up to 40% fat by weight. Fresh sausage can also contain up to 40% fat (79% of calories from fat). In a typical meal⁷⁶, these products are the most significant sources of fat relative to carbohydrate intake (see Table 2).

That maximum allowances are already established provides a framework for reducing levels of permissible fat in these products. By reducing current maximum levels, it will be possible to reduce fat intake⁷⁷. This action will make more effective efforts to encourage people to modify their eating habits. Based on the calculations of Table 2, levels no higher than 30% by weight would seem more appropriate. More of the meals outlined in Table 2 could then fall below the guideline. An additional advantage of this approach is that consumers are not compelled to reduce their consumption of a product if they wish to reduce their fat intake. Table 3 provides an alternative approach, in which caloric intake is slightly higher, but fat consumption dramatically lower. To achieve this, however, requires reductions in consumption of meat and dairy products, and a shift to lower fat offerings. A changed regulation would require of manufacturers that fat content be altered at their stage of the food chain, ensuring that consumer sales would not decline precipitously, with its associated negative financial implications for certain farmers and manufacturers. Such an approach was taken in Finland as part of a program to reduce heart disease. The fat content of a popular sausage was reduced by adding up to 25% low-fat constituents such as mushrooms⁷⁸.

Dairy products

Dairy products present quite a different situation than prepared meats. Dairy products are largely whole foods (with minimal processing unless fat is removed), whereas prepared meats are often highly processed with a number of constituents added to create the product. In general, it is preferable that people consume whole and minimally processed foods. Nutrition surveys conclude that more dairy products should be consumed. So, although dairy consumption must be promoted, we also believe that consumers should clearly understand how much fat they are consuming and plan their daily consumption accordingly.

Most dairy products are defined by a minimum level of milk fat, apparently reflecting concerns about selling adulterated (not as much fat as claimed) products. For example, cheeses in all but 2 cases are defined by minimums ranging from 15-33% fat by weight (reg. B.08.033). A cheddar cheese, then, could contain no less than 31% fat, but could, depending on the age of the cheese be higher. These levels translate to 75% fat as calories. Labels must contain percent butter fat, but this does not necessarily clarify matters for the average consumer. Butter must contain a minimum of 80% fat (virtually 100% of calories from fat). Cream has no specification at all. Two cheeses are the exception. Harzkase and skim milk cheese can contain no more than 3 and 7% fat respectively. This level of fat in skim milk cheese, although dramatically lower than regular cheeses, still translates into 31% calories from fat.

The approach taken for these skim milk cheeses, setting ceilings rather than floors, would seem more appropriate for health promotion purposes. Clearly, some cheeses require a high fat content to provide their unique flavour. If so, these cheeses should be more clearly identified as high fat products (see below).

Food labels

Label rules are contributing to consumer confusion about how much they are reducing their fat intake. We provide four examples of how this occurs.

Milk

The inconsistency between the Healthy Eating Guidelines approach to identifying appropriate levels of fat in the diet and the labelling rules create consumer confusion. This confusion is compounded in the case of milk. Labelling rules for fat require that the grams of fat per unit serving are listed on the label. Canada's Healthy Eating Guidelines for fat are listed as a percentage of energy (i.e., no more than 30% of total calories from fat). In the case of milk, however, different milks are defined by fat as a percentage of total weight. For example, skim milk must not contain more than 0.3% fat. Milk is sold in stores in a similar way. Consumers buy whole milk (usually around 3.3% fat by weight), 2%, 1% or skim. If these products were labelled in a manner consistent with the approach used in the Health Eating Guidelines, then the labels would read 51% for whole milk, 35% for 2% milk, 21% for 1%, and 7.7% for skim. Consequently, most consumers believe that consuming reduced fat milk is a far greater reduction in fat consumption than it really is.

Although it is not essential that every food product comply with the 30% guideline, in the current environment in which fat consumption is too high and consumption of foods low in fat, such as fruits, vegetables and grains, is insufficient, having an essential food like milk with such a misleading label is not helpful. However, because health professionals wish to encourage milk consumption, there is a need for a clear encompassing message on food products that tells consumers about a product's nutritional value. One possibility would be: "This food is highly nutritious but also high in fat. Suggested serving size for a healthy adult is maximum xx servings per day, the serving size being xx ounces" (xx designates amounts which are depending on product). This message would provide consumers with guidance, and, in combination with details about fat content, would offer a more comprehensive way of informing consumers about their food.

Fatty ingredients that do not need to be labelled

Certain fatty ingredients do not have to appear on a label for a prepared food⁷⁹ (reg. B.01.009). These include butter, margarine, shortening, lard, and leaf lard. If cheese is less than 10% by weight of a packaged product, it does not have to appear on the label. If vegetable and animal fats and oils are less than 15% of a prepackaged product, they do not have to appear on the label. Not seeing these products listed on the label, consumers may again believe that they are consuming products of lower fat than they really are. Also, since these products are almost 100% calories from fat, 10-15% fat by weight, in most prepared products will translate into a percentage fat of total calories that likely exceeds the dietary guideline.

Trans-fatty acids

Trans-fatty acids (TFAs) result from the high temperatures and hydrogenation process used to convert refined oils into margarines, shortenings, shortening oils and stiffened (partially hydrogenated) vegetable oils. In their natural state fatty acids have a cis configuration, and the hydrogenation process causes the rotation of one or many molecules, in effect, twisting the acid into a new shape⁸⁰. This twist, however, is thought to change substantially the fatty acid's properties, activity in the body, and ultimately effects on health.

Some scientists believe that trans-fatty acids can⁸¹:

- ! increase total cholesterol, "bad" low-density lipoprotein (LDL) cholesterol and blood fat levels, contributing factors to coronary heart disease;

- ! disrupt the functions of essential fatty acids (EFAs) which have a role in cancer prevention;
- ! reduce the activity of certain cells involved in immune function;
- ! disrupt a range of reproductive activities in both men and women.

Intake of trans-fatty acids has likely decreased in recent years as total fat intake has declined somewhat and industrial production of margarines has partially shifted to softer margarines with slightly lower trans fatty acid contents. In the USA, estimates are that trans isomers of margarines range from 7% - 24%⁸². Assuming Canadian margarines are consistent with USA ones, then trans isomer intake is still significant. Although small amounts of trans-fatty acids are not likely to be a health hazard, it is not uncommon for some people to consume large amounts of TFA if their diets regularly include hydrogenated and hard margarine, packaged cookies and pastries (as opposed to using butter and oil in home cooking).

There is no requirement to label trans-fatty acids. Their levels in food can now only be determined by calculating the difference between the total fat of the product and the total of the listed subcategories. The federal government has consistently refused to require labelling because of strong opposition from the food industry and some scientists who feel that the evidence is insufficiently conclusive. Hydrogenated oils are a mainstay of the food manufacturing and fast food industries, in part because in the hydrogenated form they are cheaper to handle and distribute. Hydrogenated oils are protected longer against rancidity and therefore products have a longer shelf life. The industry does not want to modify its use of hydrogenated fats if there is a significant consumer reaction against trans-fatty acids.

The history of change at the manufacturing level is, however, closely allied with informed consumer demand for such changes. Consumer concern about fat has encouraged changes to fat labelling rules, and such changes have, in turn, affected consumer purchasing patterns. One would expect a similar result from the labelling of trans-fatty acids. Consequently, the failure to label effectively encourages the consumption of undesirable fats.

The Netherlands has recently taken a very proactive stand against TFAs by legally requiring a reduction TFA content, to less than 1% in most margarines. Dutch scientists project that, as a result of this measure, TFA consumption for the average person will decline by 4 grams/day (compared to 10-15 years ago), and that coronary disease incidence could fall by 5%⁸³.

Product nutrition labels - comparing the USA and Canadian systems

Some in the food sector believe that Canadian consumers find US nutrition labelling more useful⁸⁴. There are regularly calls in the press for a more US-style nutrition labelling system, and the free trade agreements are exerting pressure, through Codex Alimentarius and the NAFTA, for harmonization of such systems. A brief comparison of the two systems is provided here⁸⁵.

In general, the US system is more informative for consumers. Relative to the Canadian system, its strengths are:

- C consistent and clear label formats;
- C more foods are covered by nutrient labelling regulations;
- C greater nutrient information requirements on labels, including total calories, calories from fat, total fat, saturated fat, cholesterol, sodium, total carbohydrates, dietary fibre, sugars, protein, vitamins A and C, calcium and iron;
- C more consistency in serving sizes;
- C clearer presentation of the relationship between nutrient content and average daily requirements for the nutrient;

The Canadian system is, however, also being weakened in a few areas in response to harmonization pressures:

- C Canadian criteria for many nutrient claims have been more stringent than the US. For example, a “fat-free” claim in Canada meant that the product contains no more than 0.1 g of fat per serving. In the USA, the product could have up to 0.5 g fat /serving;
- C fewer nutrient claims are allowed⁸⁶.

However, what both nations lack is comprehensive and attributable messages regarding nutrition. Both nations focus on the details of nutrition information, and fail to provide any overarching guiding messages or colour coding schemes for consumers that would help the less nutritionally literate make informed decisions.

(b) *Ontario Food Premises Regulations*

These regulations govern what foods can be sold in different premises in Ontario, how they must be prepared, and what food handling measures must be followed. These regulations apply

to all food handling premises, from restaurants to street vending carts. Of particular concern, are the rules governing street vending carts.

Toronto has thousands of cart street vendors, almost all of whom sell hotdogs and hamburgers. They are licensed to occupy specific locations by the Metro and Toronto municipal governments. Their licensing application identifies what they plan to sell, but except for a few specific circumstances, an approval is not based on what is being sold⁸⁷.

The Food Premises Regulations, in combination with the current dynamics of the street food market, effectively mean that only pre-cooked meat wieners and burgers are sold⁸⁸. This is because the regulations emerged in an earlier food safety era, when many current products were not on the market. However, notwithstanding proposed changes to the regulations, regulators have been very reluctant to permit more diversified offerings. The result, effectively, is that only higher fat food products have been available from most vending carts. Lower fat meat products have penetrated the market, but more diversified offerings (e.g., corn on the cob, candy apples, falafel, bean burritos, and tofu products) would have a greater impact.

5.2 Changes to food processing and the marketplace

Although there are lower fat options available in the market place, these changes have not been embraced enthusiastically by the food industry. Most of these changes are the result of pressures applied by consumers and consumer organizations. The food industry has also only reluctantly supported changes in consumer information rules⁸⁹.

Given this history, it is unlikely that the food industry will voluntarily reduce the number of high fat products available or provide consumers with greater information⁹⁰. The major area for further change, then, using government policy to shape the workings of the market - specifically, by developing full information systems for consumers.

We believe that our food information rules and practices stand in the way of achieving significant reductions in fat consumption. Lacking a stated consensus on the purposes of public information about food, the information that is provided is left largely to the marketers of product. The overarching problem is that no one has responsibility for determining the overall coherence of consumer food messages. Individual firms provide information that shows their products to best advantage. As a result, consumers get information that is incomplete, and which may contradict the information provided by another firm or government agency. Individual consumers do not have the resources to determine with any ease the accuracy or completeness of any firm's messages, particularly when faced with the size of food industry advertising budgets.

Government rules confound this problem because there is also little coherence between the parts and levels of government that have responsibility for advertising rules, labelling and grading systems. The healthy eating messages of health departments are often competing with contradictory messages permitted by the regulatory framework of other arms of government.

We believe that if consumers receive such information, and can make clear and easy choices for low-fat food, then their purchasing patterns will change. This, in turn, will encourage manufacturers to reduce fat in a wider range of products. When combined with changes to the Food and Drugs Act regulations, there will be significantly different market place signals, and different firm behaviour.

5.3 Restaurants and Food Service

Many restaurants will be unable to participate in Healthy Lifestyle Restaurant programs because the content of their menus is unlikely to allow them to qualify unless very major changes are made to their offerings. In particular, fast food outlets offering a menu heavy in deep fried foods, special sauces, and animal products are unlikely to receive awards.

Consequently, other measures must be undertaken to encourage different consumer buying habits and, ultimately, restaurant offerings. These measures would have to be mandatory to be effective, hence, their introduction is likely a medium term transition event. Of course in restaurants it is even more difficult to know what levels of fat are contained in a meal. There is no requirement for ingredient labelling, and a detailed breakdown is unrealistic. However, a colour coding scheme on menus that provided an understanding of how a meal might contribute to overall daily fat intake would be feasible. For example, a main course containing more than 50% of an average adult male or female's daily fat requirement would have a high colour coded rating. One containing 25-50% would have a medium rating, and one containing less than 25% a low rating⁹¹. Such a scheme would permit consumers to make more informed choices. Restaurants, on their part, would have to give more thought to menu composition.

6. Strategies to make the transition to a regime of reduced fat production and consumption and recommendations

We recommend a three-stage process of transition. Our policy and regulatory apparatus is a product of long-standing beliefs and assumptions. Its structure has been assembled over many years, generally following a pattern of incremental additions, with the overall coherence of the structure rarely assessed⁹². Consequently, we believe that an evolutionary transition to the new approach proposed here is most appropriate. We employ a transition framework that has been used previously to map out

desired changes in the food and agriculture system⁹³. This framework serves as both a guide to action, and an indicator of progress.

In this framework, Stage 1 strategies involve making minor changes to existing practices to help create an environment somewhat more conducive to the desired change. The changes would generally fit within current policy making and regulatory activities, and would be the fastest to implement. Second stage strategies focus on the replacement of one practice, characteristic or process by another, or the development of a parallel practice or process in opposition to one identified as inadequate. Finally, third stage strategies take longer to implement and demand fundamental changes in the use of human and physical resources. This final, or redesign stage, is unlikely to be achieved, however, until the first two stages have been attempted. Ideally, strategies should be selected from the first 2 stages for their ability to inform analysts about redesign (the most underdeveloped stage at this point) and to contribute toward a smooth evolution to the redesign stage.

First stage:

1. Make nutrition labels on all processed foods mandatory, and ensure that they contain information on total calories, calories from fat, total fat, saturated fat, cholesterol, and total carbohydrates.
2. Rewrite certain Food And Drugs Act Regulations so that fat production and distribution is discouraged, and consistent labelling of fat content encouraged:
 - a) Change all prepared meat food definitions so that the product can contain no more than 25% fat by weight.
 - b) Change dairy product food definitions so that maximum fat contents are specified for each type of cheese.
 - c) Change all product labelling systems so that the label contains both the grams of fat and the percentage of calories consumed as fat (consistent with Canada's Healthy Eating Guidelines)
 - d) Require labelling of all fatty ingredients.
 - e) Require labelling of trans-fatty acids⁹⁴.
3. Healthy Lifestyle Restaurant programs should become part of the Ministry of Health's mandatory program guidelines. Such programs reward restaurants offering a significant number of low-fat menu items with public recognition. They have proved very popular with restaurateurs in municipalities offering them⁹⁵.

4. Educational programs with demonstrated success in reducing consumer consumption of fat should be expanded, including workplace intervention and skills for food shopping programs.

Second stage:

5. Implement strategies to require full consumer information about food:
 - a) Labels that tell consumers how their food product complies with the government's healthy eating guidelines (e.g., "Eating this product several times a week is consistent with Canada's Guidelines for Healthy Eating" or something to that effect); this might also be achieved with a colour coding system (e.g., different colours for high, medium and low compliance). Restaurant menus would also be required to provide such colour coding to permit patrons an opportunity to evaluate how the meal they were about to order compared with recommended daily intakes.
 - b) Grading standards based more on nutritional than cosmetic criteria⁹⁶.
 - c) Just as cigarette advertising has been restricted because of the serious health effects of smoking, advertisements for junk food and those advertisements that play on people's concerns about their body image and social acceptance should be eliminated. The body image issue is related to both total dietary intake and fat consumption. Anorexia and bulimia are becoming serious health issues, particularly among teenage women, and fears about obesity are a major source of the problem. Many societal factors contribute to those fears and food advertising is a contributory one⁹⁷.
6. Transition programs (subsidies, tax credits, farm services) to encourage processors to move toward lower fat foods. There are a number of existing programs for food processors, none of which are commodity specific or have nutritional value of the product as a criterion⁹⁸. Just as the dairy subsidy reduced milk costs for processors and dairy product costs for consumers, subsidies or tax credits could be available to processors sourcing lower fat product, and sustaining its low-fat quality through processing.
7. Change taxes on food so that fresh foods are not taxed and processed ones (clearly defined) are. Under current rules, a takeout salad will be taxed, but french fries may not be. Such anomalies should be eliminated, to ensure that purchase of fresh foods are favoured by the tax system.
8. Examine the feasibility of by-laws, zoning restrictions and other measures, similar to those used

to restrict access of young people to tobacco, to limit access to high fat and highly processed foods around schools, including restricting the sale of high fat and highly processed "fast" foods in vending machines and stores within close proximity of schools⁹⁹.

9. Under the Food and Drugs Act, require, as the Netherlands has, that the trans-fatty acid content of most margarines be reduced to 1% within 1 year.

Third stage:

10. Develop demand management and supply coordination systems for optimizing the availability and nutritional value of the food supply for all residents.

Fifteen years ago, the Science Council of Canada proposed that Canada move towards an optimal nourishment scenario¹⁰⁰, but little progress has been made. Other governments have been more successful. In the 1970s, Norway set out to design its food and agriculture production and distribution system to better promote nourishment and adjusted its policies accordingly¹⁰¹. By setting goals and establishing appropriate institutional supports, they have been able to change the way the food is produced and distributed. They had four main goals:

- ! to stimulate the consumption of healthy foodstuffs (for example, grains, potatoes and polyunsaturated fats) and decrease consumption of unhealthy ones (for example, saturated fats, refined sugars) in order to reduce the incidence of some chronic diseases;
- ! to develop guidelines for food production as recommended by the World Food Council;
- ! to increase domestic food self-reliance from 39% of total calories to 52% by 1990;
- ! and to promote regional development.

Various tools have been used to achieve these goals: production and consumer subsidies, marketing promotion based on nutritional quality, consumer education programs, improved labelling systems, and legislation to penalize the production of food and drink detrimental to health¹⁰². However, the government recognized that taste cannot be legislated, and that the marketplace will still play a central role in food purchasing patterns¹⁰³.

The Norwegian strategy has produced some positive results. Self-sufficiency reached 50% by 1988, and fat as a proportion of energy in the diet dropped from 40% (1975) to 37% (1987), although some undesirable fats have been inadvertently subsidized. Consumption of whole grains, fruit and low-fat milk is up, and potato and grain quality has improved. A decline in cardiovascular deaths has been partly attributed to the Nutrition Policy. Farmers have achieved

income parity with industrial workers¹⁰⁴.

In the context of this paper, the main implications for redesigning the Canadian food and agriculture system to achieve an optimal diet include:

- a) Continuing the shift in emphasis toward animal production systems that reduce carcass fat. This could involve some combination of reducing concentrates in livestock diets (Norway proposed this), lengthening the growing period, and increasing forage intake. Changes of this nature would have substantial implications for management and design of farms, and for land use since many livestock enterprises in Canada are structured around a high concentrate diet and rapid fattening. Many farms rely on purchased feed and have insufficient land to grow their own grains and forages. Manure disposal is an associated problem on such farms.
- b) Focus on fresh food production and minimal processing. Canadians have been consuming more fresh food for some time, and this trend could be supported under an optimal diet scenario. This will require more highly developed regional distribution systems. Some parts of the processing industry would become more seasonal. Certain forms of processing would be discouraged: removal of fibre from grains; bleaching; addition of salt, refined sugar, and food additives; and boiling in fat, oil or water¹⁰⁵.
- c) Demand/supply coordination where national food demand is determined by what provides for optimal nourishment, then supply is coordinated (somewhat like what happens now with supply managed commodities) to meet that demand; foods that do not comply with this scenario are available but are highly priced to discourage excess consumption.

Endnotes

1. Ontario Task Force on the Primary Prevention of Cancer. 1995. **Recommendations for the Primary Prevention of Cancer**. Queen's Printer, Toronto.
2. Ontario Ministry of Health. 1993. **Ontario Heart Health Survey, 1992**. Queen's Printer for Ontario, Toronto.
3. Such products, unfortunately, are often higher in calories, so their overall positive impact on consumer health may be minimized.
4. For a review of the limitations of this approach to addressing nutritional problems and inequities, see Travers, K.D. 1995. "Do you teach them how to budget?": professional discourse in the construction of nutritional inequities. In: Maurer, D. and Sobal, J. (eds.). **Eating Agendas: food and nutrition as social problems**. Aldine de Gruyter, Hawthorne, NY. Pp. 213-240.

5. Undesirable fats are discussed in section 3.
6. Erasmus, U. 1993. **Fats that Heal, Fats that Kill**. Alive Books, Vancouver.
7. Sources of Fat in the Average Canadian Diet, 1992. Agriculture Canada Nutrient Assessment Program.
8. Ontario Ministry of Health. 1993. **Ontario Health Survey 1990**. Queen's Printer for Ontario, Toronto.
9. And remains in many societies. Sobal cites evidence that in 85% of traditional societies for which there are data, a plump body is desirable. See Sobal, J. 1995. The medicalization and demedicalization of obesity. In: Maurer, D. and Sobal, J. (eds.). **Eating Agendas: food and nutrition as social problems**. Aldine de Gruyter, Hawthorne, NY. Pp. 67-90.
10. Whit, W.C. 1995. **Food and Society: a sociological approach**. General Hall, Dix Hills, New York.
11. Sobal. 1995 [see note 9]; Levenstein, H. 1993. **Paradox of Plenty: a social history of eating in modern America**. Oxford University Press, New York. The most extreme expressions of this social norm are found in anorexic and bulimic behaviour. See Way, K. 1995. Never too rich ... or too thin: the role of stigma in the social construction of anorexia nervosa. In: Maurer, D. and Sobal, J. (eds.). **Eating Agendas: food and nutrition as social problems**. Aldine de Gruyter, Hawthorne, NY. pp. 91-113.
12. Whit. 1995 [see note 10].
13. Note that the Food Guide, although setting a reasonable standard, is not set solely by scientific criteria. The creation of food guides has for many years in many countries been a product of scientific, socio-economic and political forces. The determination of "optimal" levels of fat is, thus, influenced by such forces as the power of economic players, including different commodity sectors and food retailers. For a British case study of this process, see Smith, D. 1995. The social construction of dietary standards: The British Medical Association - Ministry of Health Advisory Committee on Nutrition Report of 1934. In: Maurer, D. and Sobal, J. (eds.). **Eating Agendas: food and nutrition as social problems**. Aldine de Gruyter, Hawthorne, NY. Pp. 279-303. The animal commodity organizations were seen, from Freedom of Information releases of minutes, to have had significant influence over the recent revisions to the Canadian Food Guide.
14. Health and Welfare Canada. 1990. **Nutrition Recommendations: the report of the scientific review committee**. Ministry of Supply and Services, Ottawa; Note that many believe it should be even lower, as low as 15-20%. See for example, Ornish, D. et al. 1990. Can lifestyle changes reverse coronary heart disease? **The Lancet** 336:129-133; Barnard, N.O. 1993. **Food for Life: how the new 4 food groups can save your life**. ????. Issues of the **Nutrition Advocate**, a newsletter edited by Cornell University Nutritionist T. Colin Campbell, director of the China Study.
15. Much of this section is taken from McKeown-Eyssen, G., Uetrecht, C., Sokoloff, E. and Jazmaji, V. 1993. **Food and Nutrition in Metropolitan Toronto: a descriptive report of nutrition data of the Ontario Health Survey**. North York Community Health Promotion Research Unit, North York, ON. We are grateful for their permission to use extensively their data and descriptions of the nutrition - health relationship.
16. Latest national survey results
17. Ontario Ministry of Health, 1993 [see note 8].

18. Allison, K.R. 1995. **Physical Activity in Ontario: an analysis of the Ontario Health Survey**. Public Health Branch, Ontario Ministry of Health, Toronto.
19. In addition to McKeown-Eyssen et al. 1994 [see note 15], see the forthcoming Toronto Food Policy Council Discussion Paper #3, **If the Health Care System Believed You Are What You Eat: strategies to integrate our food and health systems**.
20. Note that excess fat consumption is not the only contributing factory to obesity.
21. Health and Welfare Canada. 1988. **Canada's Health Promotion Survey: technical report**. Ministry of Supply and Services, Ottawa.
22. This data was collected by repeating the 1985 study. Health and Welfare Canada. 1993. **Canada's Health Promotion Survey 1990: technical report**. Ministry of Supply and Services, Ottawa.
23. US Surgeon General. 1988. **Report on Nutrition and Health**. US Department of Health and Human Services, Public Health Service, Washington, DC; Health and Welfare Canada. 1988. **Promoting Healthy Weights: a discussion paper**. Ministry of Supply and Services, Ottawa.
24. US Surgeon General. 1988 [see note 23].
25. Ontario Ministry of Health. 1993. **Ontario Heart Health Survey, 1992**. Queen's Printer for Ontario, Toronto.
26. US Surgeon General. 1988 [see note 23].
27. Health and Welfare Canada. 1990 [see note 14].
28. Ornish et al. 1990. [see note 14]. Barnard et al. Economics study
29. Health and Welfare Canada. 1990 [see note 14].
30. Data from the Ontario Cancer Treatment and Research Foundation, Ontario Cancer Registry, 1994.
31. US Surgeon General. 1988 [see note 23]; Faculty of Medicine. 1994. Exploring the diet-cancer links. **University of Toronto Faculty of Medicine Health News** 12(3):6-7.
32. US Surgeon General. 1988 [see note 23]; Faculty of Medicine. 1994 [see note 31].
33. For more on this see TFPC. 1997. If the health care system believed you are what you eat: strategies for integrating our food and health care systems. TFPC Discussion Paper #3, Toronto.
34. Note that significant changes have also been to government support programs, but these changes appear not to have affected fat content.
35. Retailers complain about the heavier weight because it is difficult to get smaller cuts. This lowers saleability, because the cost of individual pieces are so high. Retailers have a preference for pieces under \$20.

36. The British brought over herefords, shorthorn and black angus, which had been bred to make muscle from low quality range feeding. The French brought Charolais and Limousine cattle which were bred on high quality grain, converting this into high quality meat. These animals can be bred in confinement and on a high caloric diet without becoming obese, because they put the energy into muscle. Herefords and black angus on the other hand, would become obese if bred in confinement. Another difference is that Herefords need body fat to conceive while other breeds need high quality nutrition to conceive. Genetics is directly related to the diet that you feed.

37. For example, range fed beef from Australia and New Zealand is usually only of processing quality because it is not very tender.

38. The National Cattlemen's Association (NCA) pays for beef grading, not the federal government. NCA hires an inspector to enforce federal standards.

39. Although leaner carcasses generally command a higher price on the market, within the A grade (A,AA,AAA), price does not differ.

40. Glen Headly, Ontario Cattlemen's Association, personal communication, Sept '95.

41. Glen Headly [see note 40].

42. The dominant dairy breeds at that time were Ayrshire and Milking Short Horn. Currently, high butterfat dairy breeds are Holstein, Guernsey, Jersey and Brown Swiss.

43. The old system was seen to be inaccurate because it assumed that butterfat and protein were always found in the same proportion. This is not always the case. Although butterfat and protein are genetically positively correlated, the ratio is not always consistent. The new system was refined to recognize not just butterfat, but also protein and other solids (e.g., milk sugar, minerals). The declining federal subsidy is still only paid on the butterfat component. With multicomponent pricing, farmers are paid for three components: butterfat (which receives the federal subsidy on industrial milk), protein, and other solids. There has been a shift in the multicomponent pricing system towards protein and away from fat. Although processors pay based on the use of the milk, generally, protein receives \$3 more per kilo than fat. Consequently, many farmers have increased grain in the diet, and reduced hay, to increase protein content. As well, many are using sub-therapeutic doses of antibiotics, like Rumensin, to increase yield and reduce fat content. This puts much greater stress on the animals.

44. The cow gut is designed to live on grasses, not grains.

45. The scheme is currently only being implemented in Alberta because there are very few large plants in Ontario. There is only one large plant in Ontario for federally inspected lamb. All the others have provincially inspected lamb.

46. Except for those who grow their own crops who may be eligible for GRIP and NISA.

47. Poultry and turkey have been the only animals with minimum fat requirements for grading (Personal communication, Dave McGonegal, Agriculture Canada Market Industry Branch, Sept. 95).

48. Information from the Canadian Chicken Marketing Agency, 1995.

49. Almost all chickens are currently grain fed. Corn and soybeans are the main ingredients of chicken feed. In free range systems, chickens do eat grains, but their diets are diversified with grasses, other seeds and insects, and the birds are more active.
50. Broilers are categorized as weighing up to 6.2 kg, hens from 6.3-9.8 kg (graded) and toms from 9.9 kg and over (ungraded).
51. Sandy Vanderheyden, Turkey Producer's Marketing Board, personal communication, Sept '95.
52. Stillings, B.R. 1994. Trends in foods. **Nutrition Today** 29:6-13.
53. Raj, S. and Clancy, K.L. 1995. Attitudes of processors and distributors towards processing in the Natural Foods Industry. **Biological Agriculture and Horticulture** 12:209-226.
54. Stillings. 1994 [see note 55].
55. Stillings. 1994 [see note 55].
56. Statistics Canada. 1994. **1992 Family Food Expenditure in Canada**, Catalogue #62-554, Supply and Services, Ottawa.
57. See, for example, the Lifestyle Approved Restaurant Program, sponsored by the Toronto Public Health Department and the Heart and Stroke Foundation of Ontario.
58. See Winson, A. 1992. **The Intimate Commodity: food and the development of the agro-industrial complex in Canada**. Garamond Press, Toronto; MacRae, R.J. et al. 1993. Strategies to overcome barriers to the development of sustainable agriculture in Canada: the role of agribusiness. **J. Agricultural and Environmental Ethics** 6:21-53.
59. One of the consequences of corporate concentration is that a few firms can "shape" the market place. According to market theory, markets only work efficiently when there are enough buyers and sellers that no one can influence directly the price.
60. The ways by which governments influence economic policy have been documented by a host of authors, including Kneen, B. 1992. **Trading Up**. NC Press, Toronto.
61. Schmid, T.L. et al. 1989. Public support for policy initiatives regulating high-fat food use in Minnesota: a multicomunity study. **Preventive Medicine** 18:791-805.
62. Note that we are opposed to the current trade agreements because of their detrimental impacts on food security. Consequently, although we believe that government support programs have not been well designed, we also do not accept that changes to government support programs should be driven by trade considerations. In our view, a new regime of government supports must be installed that supports the transition to a sustainable and health promoting food system (see the Toronto Food Policy Council Discussion Paper #5, **Setting a New Direction: changing Canada's agricultural policy making system**).
63. For a review, see MacRae, R.J. et al. 1990. Policies, programs and regulations to support the transition to sustainable agriculture in Canada. **American J. Alternative Agriculture** 5:76-92. Also, the International Institute for Sustainable Development is currently preparing an environmental critique of certain government support programs.

64. For critiques, see Toronto Food Policy Council. 1994. **Health, Wealth and the Environment: the impacts of the CUSTA, NAFTA and GATT on Canadian food security**. Discussion Paper #2, Toronto Food Policy Council, Toronto; Toronto Food Policy Council. 1995. **Setting a New Direction: changing the agricultural policy making process**. Discussion Paper #5, Toronto Food Policy Council, Toronto.
65. It is a subsidy on industrial milk because this is an area of federal jurisdiction. Fluid milk is provincial jurisdiction.
66. The total price farmers receive for milk is based on a cost of production formula.
67. Note that retailers usually sell fluid milk for lower than what they pay ("loss leaders") for sales and promotion purposes.
68. Richard Caine, Manager, Trade Policy and Intergovernmental Relations, personal communication, Oct '95.
69. See Gussow, J.D. and Clancy, K.L. 1986. Dietary guidelines for sustainability. **J. Nutrition Education** 18:1-5; Herrin, M. and Gussow, J.D. 1989. Designing a sustainable regional diet. **J. Nutrition Education** 21:270-275.
70. One of the earliest and popular proponents of this approach was Francis Moore Lappé, whose book, **Diet for a Small Planet** sold millions of copies.
71. For more on a sustainability framework and the limitations of current policy, see MacRae et al. 1990 [see note 66]. See also, Toronto Food Policy Council (TFPC). 1995 [see note 67].
72. For a brief overview of this history, see Anderson, C. 1995. The food information war: consumer rights and industry prerogatives. In: Maurer, D. and Sobal, J. (eds.). **Eating Agendas: food and nutrition as social problems**. Aldine de Gruyter, Hawthorne, NY. Pp. 167-187.
73. Food and Drugs Act and Regulations. 1981 with amendments to Dec. 15, 1993.
74. Note that the Guidelines themselves are framed within a traditional individual behaviour modification approach to health promotion, and this makes them less useful as a measure for the kinds of structural changes addressed in this report.
75. All percentages are calculated from: Health and Welfare Canada. 1988. **Nutrient Value of Some Common Foods**. Supply and Services Canada, Ottawa.
76. Note again that the Guidelines relate to the whole average diet, not to individual products. However, certain kinds of foods (particularly meats) have long been the centrepiece of the traditional Canadian diet. It is sensible that such products be clearly measured against the whole diet standard.
77. One might argue that if the cook drains the fat well, then consumption would be reduced. This argument is consistent with a lifestyle behaviour modification approach to dealing with health promotion, rather than a systemic analysis of the forces contributing to fat consumption. Put another way, it makes little sense to produce something (in this case fat) so that we can then throw it away. The solution is to reduce its production before it reaches the consumer.
78. Schmid et al., 1989 [see note 64].

79. Note that some other, non-fatty ingredients are also on this list.
80. One metaphor that has been used to describe this twisting is to imagine that the top half of your body is twisted to that your back is now facing forward. See Erasmus. 1993 [see note 6].
81. Cf. Holub, B. 1991. Cholesterol-free foods: where's the trans? **Canadian Medical Association** 144:330; Erasmus. 1993 [see note 6]; Enig, M. et al. 1990. Isomeric trans fatty acids in the U.S. diet. **J. American College Nutrition** 9:471-486; Willett, W.C. et al. 1993. Intake of trans fatty acids and risk of coronary heart disease among women. **The Lancet** 341:581-585.
82. Willett et al. 1993 [see note 84].
83. See Anon. 1995. The Netherlands reduces Trans Fatty Acids in foods. **Nutrition Week** 25(45):3; and **Lancet** 346:1245-46 (November 11, 1995).
84. From our interviews with firm marketing specialists.
85. Much of this section is based on work done by the Center for Science in the Public Interest of Washington, DC.
86. In some cases this is a problem, but compared to the US system, fewer potentially misleading claims are allowed.
87. Personal communication, Henry Kelly, Toronto Department of Public Works and the Environment, January, 1993.
88. The regulations are currently in the process of revision, and the revised regulation (issued in June 16, 1994), extending the range of foods available, states that "class III temporary/mobile food service premise [vending carts] means a premise in which no preparation of food shall take place except for the reheating of pre-cooked meat products in the form of wieners and similar sausage products to be served on a bun, cooking and reheating of non-hazardous foods, and the slicing, dicing and mixing of prewashed fruits and pre-washed vegetables". Recently, municipal inspectors have allowed the sale of pre-cooked tofu wieners and burgers because they have judged them to be non-hazardous. This decision is not specifically mentioned in the regulations.
89. For details of this, see Anderson. 1995. [see note 75].
90. The industry's own surveys show there is substantial dissatisfaction with current information systems, and this dissatisfaction is linked in part to difficulties with nutrition terms on labels. See, Grocery Products Manufacturers of Canada. 1995. **Grocery Attitudes of Canadians 1995**. GPMC, Don Mills, ON.
91. Because of the complexity of looking at all the components of a restaurant meal (beverage, appetizer, main course, and dessert) it might not be feasible to code all the components.
92. Cf. Plumptre, T.W. 1988. **Beyond the Bottom Line: management in government**. Institute for Research in Public Policy, Halifax.
93. See Hill, S.B. 1985. Redesigning the food system for sustainability. **Alternatives** 12(3/4):32-36; MacRae et al., 1990 [see note 66].
94. The Food and Drug Administration (FDA) in the USA has been petitioned to require labelling and will soon be considering the petition. See: FDA to consider labelling foods with trans fat. **Nutrition Week** 27 (1995):6-7.

95. North York currently has Ontario's most significant program and it could be strengthened and provide a model for other municipalities.
96. See MacRae et al. 1990 [note 66] for an example of new grading criteria.
97. Pollay, R.W. 1986. The distorted mirror: reflections on the unintended consequences of advertising. **J. Marketing** 50:18-36; Way. 1995 [see note 11].
98. Personal communication, Scott Terrio, Food Industry Branch, Ontario Ministry of Agriculture, Food and Rural Affairs, October 95.
99. This comparison between smoking and food access interventions has been drawn by Jeffery, R.W. et al. 1990. Community attitudes toward public policies to control alcohol, tobacco, and high-fat food consumption. **American J. Preventive Medicine** 6:12-19.
100. Science Council of Canada. 1979. **Canadian Food and Agriculture: sustainability and self-reliance**. Science Council of Canada, Ottawa.
101. Norwegian Ministry of Agriculture. 1975. On Norwegian Nutrition and Food Policy. Report #32 to the Storting, Oslo.
102. Ringen, K. 1977. The Norwegian food and nutritional policy. **American J. Public Health** 67:550-551.
103. Winikoff, B. 1977. Nutrition and food policy: The approaches of Norway and the United States. **American J. Public Health** 67:552-557.
104. Milio, N. 1988. An analysis of the implementation of Norwegian nutrition policy, 1981-87. Report prepared for the World Health Organization 1990 Conference on Food and Nutrition Policy. University of North Carolina, Chapel Hill, NC.
105. See Grimme, L.H., R. Altenburger, M. Faust and K. Prietzel. 1986. Towards an ecotrophobiosis: Developing a strategy in relation to food and health from a life sciences point of view. FAST Occasional Paper #106, Commission of the European Communities, Brussels; Hall, R.H. 1974. **Food for Nought: The decline in nutrition**. Harper and Row, Hagerstown, MD; Silverstein, B. 1984. **Fed Up: The food forces that make us fat, poor and sick**. Black Rose Books, Montreal.