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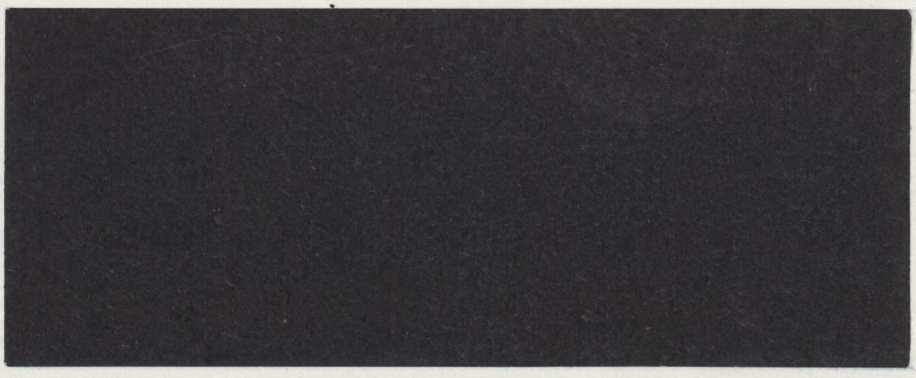

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WITHDRAWN

# PSE FOR BEEF IN CANADA: AN EXAMINATION OF METHODS

ARPD Working Paper 9-93

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# PSE FOR BEEF IN CANADA: AN EXAMINATION OF METHODS

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# PSE FOR BEEF IN CANADA: AN EXAMINATION OF METHODS

## 1. Introduction

Measuring transfers to agriculture by means of a Producer Subsidy Equivalent (PSE) has become increasingly common. The adoption by the Organization for Economic Cooperation and Development (OECD) of a PSE as an indicator of transfers in its yearly policy monitoring reports has been one of the stimuli for this development. However, the OECD method for estimating PSE for beef (and also for milk) has not been finalized, resulting in a qualification being attached to the PSE estimates for beef published by the OECD in its monitoring reports. Canada is one of the countries which have not accepted the OECD PSE estimates for beef.[1]

The purpose of this paper is to explain the method and data used by the OECD to estimate PSE for beef for Canada, examine the consequences of using these particular data for the size of the PSE estimate, and assess the sensitivity of the PSE estimate to using different data for one component of the PSE (a different production level for part of the market price support component). The OECD PSE for beef in Canada is also compared to other measures of transfers, in particular the PSE estimated by the United States Department of Agriculture (USDA) and the OECD PSE for beef in the United States.

## 2. PSE: Definition, Background, Use, and Acceptability

### 2.a. Definition

"The PSE is an indicator of the value of the **transfers** from domestic consumers and taxpayers to producers resulting from a

given set of agricultural policies, at a point in time. Thus the PSEs are aggregate measures of the total monetary value of the assistance to output and inputs on a commodity-by-commodity basis, associated with **agricultural policies.**"[2] (Cahill and Legg, 1990, p. 15).

2.b. Background

A series of papers developed for the Food and Agriculture Organization of the United Nations (FAO), including FAO (1973) and FAO (1975), lays out the framework for estimating a PSE.[3] A key feature of PSE as developed for the FAO was that the measure counted not only the transfers to producers created by trade barriers, nor only the transfers created by, or measured as, government outlays (or revenue forgone). The PSE measures both of these components of the total transfer to producers.

The PSE as developed for the FAO thus went far towards operationalizing the idea expressed in the Haberler report (GATT, 1958, pp. 83-84): "In principle the best way of measuring the degree of total protection given to any line of agricultural production in any country by the combination of protective devices used in that country would be to measure the percentage by which the price (including any subsidy) received by the domestic producer exceeded the price at which the product was available from foreign suppliers or could be sold to foreign consumers".

In the early 1980s the OECD embarked on the Ministerial Trade Mandate (MTM) in agriculture. Many of the activities undertaken under the MTM were to be particularly relevant to the initiation and conduct of the Uruguay Round of negotiations on agriculture under the GATT. Among these were the development and use of the PSE method to estimate yearly transfers to producers of individual major commodities in each OECD country (or set of

countries in the case of the European Community). The total transfer counted in PSE included "the transfers to farmers from agricultural policies, implemented with a wide range of often complex and inter-related instruments" (Cahill and Legg, 1990, p. 14).

2.c. Use

Between 1987 and 1990 the OECD published a series of country studies covering most OECD countries. These studies focused on making transparent the policy interventions used by each country in its agricultural sector, with a view to improving the understanding of how national policies affect international trade. Estimates of PSEs were an important component of these country studies, allowing a certain consistency among countries and commodities in the representation and analysis of agricultural policies.[4]

The transparency achieved with regard to individual OECD countries' agricultural policies has been and is key to the yearly policy monitoring carried out by the OECD since 1988. This monitoring includes an assessment of the extent to which agricultural policy changes in a country have conformed with the principles for policy reform first enunciated by OECD Ministers in 1987 (OECD, 1989c) and reinforced more recently (OECD, 1992a). For the purpose of monitoring, the OECD has generated annual updates and extensions of the PSE estimates initially appearing in the country studies for the MTM.

The OECD PSE method and estimates have found direct and indirect use in the GATT negotiations in agriculture, especially in the area of internal support, where the Aggregate Measure of Support (AMS) resembles the PSE. Some participants in the GATT negotiations use estimates of AMS that are identical to or based on OECD PSE estimates. PSE estimates using approaches similar to

those of the OECD PSE have also been generated by, inter alia, the USDA, and have been used by countries not only for trade negotiations but also as input in the process of domestic policy reform.

The Canada - U.S. Free Trade Agreement specifies an estimation procedure for one version of PSE. A comparison of these PSE estimates in the two countries is part of a process triggering the removal of certain import barriers for grains. In Canada, estimates of net benefits for individual provinces in many ways use the same approaches as PSE, and the estimates are used in the process of agricultural policy decision making (Committee of Experts, 1991a; Committee of Experts, 1991b; Meilke, 1991).

2.d. Acceptability

The methods and data sets agreed upon for each country's OECD PSE estimates are the product of technical discussions and compromises. For example, while there are many ways in which, say, government-funded export subsidies could have been represented, one way had to be found that not only accounted for the great variety of export subsidy instruments used by different countries but also adequately measured the transfers to producers in one country generated by that country's set of instruments. Likewise, because farmgate price series are not always available, acceptable proxy series had to be agreed upon. While OECD PSE estimates appear in OECD monitoring reports under the responsibility of the Secretary-General (rather than that of the OECD Committee for Agriculture), they are in most cases not contested by the countries concerned.

Significant exceptions from the general acceptability of OECD PSE estimates are evident in the qualification attached to the estimates published in OECD monitoring reports: "(...), the

calculation of the market price support element of the beef and milk estimates is still the subject of examination, (...), although the competent OECD bodies have agreed to maintain the present methodology in force for the present Report" (OECD, 1992a, p. 128). A note attached to that statement explains that the methodological question regarding the beef and milk PSE involves the reference prices used to calculate the market price support component of support.

The fact that a qualification similar to the one appearing in the 1992 monitoring report has appeared in all other monitoring reports since 1989 attests perhaps to the difficulty in agreeing on reference prices for the two commodities in question (beef and milk). As far as beef is concerned, the PSE estimates published since 1989 by the OECD are based on a reference price for a New Zealand product, without any recognition that different reference prices would be appropriate for different segments of the Canadian beef sector.

Using a reference price based on New Zealand product for the whole beef sector has the effect of greatly exaggerating the PSE for beef in Canada (and also in the United States). The rest of this paper examines the issues involved in more detail and provides estimates of PSE for beef in Canada based on an application of the New Zealand based reference price to only part of the Canadian beef sector.

## 3. Policy Categories in OECD PSE

OECD PSEs are intended to include transfers generated by a sub-set of all policy interventions which influence production, consumption and trade: that sub-set which contains only policies specific to agriculture (Cahill and Legg, 1990, p. 22). Agriculture is understood as primary agriculture, i.e., farming, to the exclusion of processing and distribution activities.

Given the considerable number of countries/regions and commodities for which OECD PSEs are estimated, a large number of different policy interventions must be accounted for (the number is even larger in the case of USDA PSEs, covering more countries and commodities). Much of the transparency of the OECD estimation is achieved by sorting individual policy interventions into five categories, where the categories are defined in terms of effects of the policy intervention on prices or costs. The total PSE is the sum of the transfers effected through policies in these five categories.

The categories are defined as (Cahill and Legg, 1990):

A. **Market Price Support (MPS)**: Policies which simultaneously affect producer and consumer prices (primarily trade measures);

B. **Direct Payments**: Policies which transfer money directly to producers without raising prices to consumers (levies can be considered a negative direct payment);

C. **Reduction of Input Costs**: Policies which lower input costs (capital is seen as one input like any other);

D. **General Services**: Policies which in the long term reduce costs but where transfers are not directly received by producers;

E. **Sub-national** and **Other**: other indirect support (mainly transfers through policies other than those of a national or federal government, and taxation concessions).[5]

## 4. Market Price Support

### 4.a. MPS in OECD PSE in General

Transfers through polices in the market price support category are measured by a "price gap" method.[6] The gap refers to the difference between the domestic, policy-supported, price and the (lower) reference price. The reference price is a world market price, as estimated or observed at the border of the country in question. The price gap is multiplied by the appropriate quantity of production. For example, in the case of poultry meat in Canada, the price gap resulting from supply management (such as import control, domestic production control, and formula pricing) is multiplied by total production. In the case of wheat in Canada, the price gap attributable to the Western Grain Transportation Act is multiplied by the production of wheat in western Canada (wheat in eastern Canada is not eligible for the transportation subsidy).

Using the price gap method obviates the need to account for the individual effects of a sometimes large number of policy interventions which together generate the price gap. For example, a country's government may pay various forms of subsidies to exporters of a commodity, while at the same time several forms of non-tariff barriers impede the country's imports of the commodity. Estimating the effects on the domestic price of such a combination of instruments, using, say, expenditures on export subsidies, volumes of exports, and volumes of imports, would be a large undertaking, the transparency of which would not necessarily be assured. While the price gap method cuts through this complexity, it goes almost without saying that transparency requires the estimated price gap to be accompanied by an explanation of how individual policy instruments operate in combination to generate the gap.

Market price support to the production of feeds (grains and oilseeds in Canada) require feed users to pay more for feed than they would have done in the absence of the market price support policy. While this cost increase is not entered specifically as a negative policy support element in PSE for livestock commodities, it is accounted for in the "feed adjustment" carried out for livestock PSE. This adjustment was originally introduced as a means to avoid double counting of support when aggregating PSE across crop and livestock commodities. It constitutes the difference between gross PSE and net PSE for livestock commodities, where net PSE is the PSE after subtracting the price gap on feeds multiplied by feed consumption.

4.b. MPS in OECD PSE for Beef

The policy interventions underlying the OECD MPS estimate for beef in Canada are the import tariff ($44.1 per tonne) and the Meat Import Act (MIA).[7] Of these, the price gap attributable to the import tariff alone is very small in relation to the price gap attributed to the combination of the two interventions. This is especially so from 1989, following the tariff reductions under the Free Trade Agreement with the U.S.[8]

In the case of beef in Canada, market price support in OECD PSE is estimated on the basis of a gap between the price of cow beef in Canada and the price of cow beef in New Zealand (to which price a transportation cost to Canada has been added).[9] This gap for cow beef forms the basis for the calculation of a price gap for the whole beef sector at the farm level, as follows. The price gap for cow beef, first estimated in dollars per tonne, is also expressed as a percentage of the domestic price of cow beef in Canada. This percentage is applied to the domestic average price of all beef in Canada, generating another estimate in dollars per tonne. The arithmetic average of these two gaps, in dollars per tonne, is then the estimated price gap for the whole

beef sector. This method seems based more on expediency than on any particular hypothesis about economic behaviour.

The price gap derived from the prices of cow beef is multiplied, not by the production of cow beef, but by the production of all beef. This procedure assumes that the policy instruments giving rise to the price gap for cow beef have equal effects, on average, on the domestic prices of all segments of the domestic beef sector.

### 4.c. Comparing MPS in USDA PSE and OECD PSE for Beef

Policies making up the category MPS for beef in OECD PSE (import tariffs, MIA) are put in the category Price Intervention in USDA PSE (see Tables 1.g. and 1.h. for USDA PSE for beef in Canada and the U.S., respectively). However, USDA PSE for beef in Canada accounts for only tariffs, giving the reason for not counting it in the MPS estimate as "Only in effect during 1985; insufficient data or method to determine impact" (Webb et al., 1990, p. 74). Consequently, the USDA MPS estimate for beef in Canada is only about $45 mill., compared to the OECD estimates which are of the order of $1,000 mill.

## 5. Direct Payments

### 5.a. Direct Payments in OECD PSE for Beef

Two kinds of interventions are counted as Direct Payments in OECD PSE for beef for Canada. First, payments under the National Tripartite Stabilization Program (NTSP) and, prior to 1986, the Agricultural Stabilization Act appear under the label "Deficiency paym. (ASA)" (see Table 1.e). In line with the principle adopted by the OECD for similar cost-shared programs in Canada (e.g., the Western Grain Stabilization Act) and other countries, only a portion of the gross NTSP payment for production in a particular

year is counted as a PSE component. This portion is the amount arrived at by multiplying the gross payment by the share of governments in funding the program. In the case of NTSP, federal and provincial governments together are responsible for two-thirds of the funding and, therefore, two-thirds of the gross payment for beef is counted in OECD PSE.

Second, in several years between 1980 and 1988 various ad hoc programs involving the federal government made payments to livestock producers, including beef producers, in connection with natural calamities. Most often these programs made payments in connection with droughts. OECD PSE account for these payments under the label "Disaster (drought, etc.)."[10] In situations where payments are not made specifically to the beef enterprise, an allocation of the total payment is made, usually in proportion to a value of production measure.

Provincial governments' direct payments to producers (these payments have sometimes been substantial in the case of beef) are accounted for in the category Sub-national (see Section 8. below).

5.b. Comparing Direct Payments in USDA PSE and OECD PSE for Beef

USDA PSE count "ASA/tripartite payments" to producers in the category Income Support. In the years 1984-87 there are significant differences between the USDA and OECD estimates of transfers in the form of ASA/NTSP payments. The differences may be partly due to differences in the method of accounting for expenditures made one or several years after the year of production or sales. The USDA estimates for a year appear to be based on government expenditures in that particular year, regardless of when the production or sales took place for which the deficiency payment is made. The OECD estimates, on the other hand, accrue the payments made in several fiscal years to the

year when the sales, for which payments are made, took place. USDA estimates also appear to be based on non-commodity specific expenditure data, while OECD estimates rely on payment data that are specific to beef.

Miscellaneous federal expenditures (such as drought relief) are included as "Financial assistance, other" under Income Support in USDA PSE. The USDA estimates also use an allocation method, based on a value of production, in cases where public accounts data on expenditures are not specific to beef. The estimates shown by the USDA are much different from those of the OECD, although the order of magnitude is the same. It has not been possible to trace the reason for the differences between the estimates.

## 6. Reduction of Input Costs

### 6.a. Reduction of Input Costs in OECD PSE for Beef

The category Reduction of Input Costs consists of three kinds of policy transfers: (1) federal interest concessions, (2) federal fuel tax concessions, and (3) feed freight assistance.[11] These non-commodity-specific transfers are allocated to beef in proportion to a value of production measure. Provincial interest concessions and fuel tax concessions are accounted for in the category Sub-national, to the extent these concessions are reflected in provincial public accounts.

Federal interest concessions in OECD PSE are made up of public account expenditures under the Farm Improvement Loans Act (more recently the Farm Improvement and Marketing Cooperative Loans Act), the Farm Loans Interest Rebates Act in the early 1980s, and contributions in respect of the Farm Debt Review Process. Federal fuel tax concessions represent tax rebates and tax refunds on gasoline and diesel. Feed Freight Assistance is

reflected as the government's expenditure that reduces the cost of the feed input in parts of Canada.

### 6.b. Comparing Reduction of Input Costs in USDA PSE and OECD PSE for Beef

USDA PSE accounts for only Feed Freight Assistance, in the category Inputs Assistance. The estimate of this component are based on the same data as those of the OECD and the two estimates are very close.

## 7. General Services

### 7.a. General Services in OECD PSE for Beef

The category General Services consists of three kinds of policy transfers that are not necessarily made directly to producers: (1) research, advisory services, and training, (2) inspection (which also includes pest and disease control), and (3) structures and infrastructures. Only federal expenditures for these purposes are counted - provincial expenditures are included in the category Sub-national. Most of the expenditures on General Services are non-commodity-specific, and an allocation in proportion to a value of production measure is usually carried out.

The main component of federal expenditures on research, advisory and training as reported in OECD PSE is the activity of Agriculture Canada's Research Branch. Federal expenditures on inspection etc. refer primarily to Agriculture Canada's Food Production and Inspection Branch. No account is taken of cost recovery in that Branch. Federal expenditures on structures and infrastructures are to a large extent those of Agriculture Canada's Prairie Farm Rehabilitation Administration and Agriculture Development Branch, those made under Economic and

Regional Development Agreements, and certain marketing and promotion expenditures.

7.b. Comparing General Services in USDA PSE and OECD PSE for Beef

USDA PSE show "Inspection services" and "Marketing/promotion" in the category Marketing Assistance, and "Development, structural" and "Research and advisory" in the category Infrastructure support. Expenditures on marketing/promotion are shown to be small compared to expenditures in the other three categories. The data measure federal expenditures and are based on public accounts (in the case of marketing/promotion, a USDA source is referred to). The size of the expenditures on general services in USDA PSE is close to that reported in OECD PSE.

**8. Sub-national**

8.a. Sub-national in OECD PSE for Beef

Expenditures by provincial governments in support of agriculture are accounted for in OECD PSE in the category Sub-national. The data are based on public accounts. In order to avoid double-counting in the case of federal-provincial cost-shared programs, the contributions by provincial governments to such programs as crop insurance and tripartite stabilization are not counted in provincial expenditures. Provincial expenditures are mostly allocated to individual commodities in proportion to a value of production measure. However, provincial governments' expenditures on provincial stabilization programs for hogs and beef are attributed directly to these two commodities.

8.b. Comparing Sub-national in USDA PSE and OECD PSE for Beef

Provincial expenditures are accounted for in the category Regional Support in USDA PSE. The amounts in this category are substantially lower than what is shown as "Sub-national" in OECD PSE. It appears that the expenditures counted in USDA PSE are only direct payments that increase revenue or rebates that reduce costs. This is a narrower measure than that used in OECD PSE, which comprises all provincial government expenditures other than for administration and major cost-shared programs.

There are no policies accounted for as "Other" in either OECD PSE or USDA PSE for beef in Canada.

## 9. Alternative Estimates of MPS for Beef in Canada

9.a Segmentation of Beef Production in Canada

As indicated in Section 2 above, the OECD PSE estimate for beef is subject to qualifications regarding the estimation of MPS. This qualification is particularly pertinent to the MPS estimate for Canada. This estimate is based on a price gap for cow beef, applied to the whole Canadian beef sector. The tariff on imports of beef is subsumed in this gap.

It is well recognized that Canada's beef sector consists of two distinct segments: high quality and low quality (manufacturing) beef. The markets for beef and cattle in Canada and the U.S. are highly interactive, with trade occurring between the two countries in both live cattle and calves and in beef. Prices of cattle and calves in Canada and the U.S. move together. Analytical results suggest that even drastic changes in Canada's imports of beef from off-shore would have only very small effects on prices of low-quality beef and even smaller effects on prices

of high-quality beef in Canada (see, e.g., Martin et al., 1991, and Agriculture Canada, 1991).

Such evidence supports arguments that the existence of the MIA does not provide a policy transfer to the high-quality segment of Canada's beef production, and consequently there would be no MPS component for that segment of beef production. In other words, applying the price gap for cow beef to all beef production in Canada is not justified.

The Canadian and U.S. beef markets are not only integrated as a North American market - this region is also a net exporter of high-quality or grain-fed beef. This makes it appropriate to use a North American (i.e., U.S. or Canadian) reference price for the high-quality segment of Canada's beef sector. If a U.S. reference price was used, the observed price gap for the MPS estimation would likely be small. Given the small size of the difference between Canadian and U.S. prices for comparable grades, and after adjusting for transportation costs, the price gap would possibly be so small that the MPS for the high-quality segment could be ignored, i.e., the same outcome as under the hypothesis of no policy transfer to the high-quality segment.

It could be argued that the MIA component of MPS should be based on a larger quantity than the production of cow beef. For example, the manufacturing beef segment includes meat from all animals not grading high enough to enter the high quality market (such as bulls and cows) and trimmings from carcasses otherwise destined for the high quality market. If it were assumed that the existence of the MIA does provide a policy transfer to the manufacturing segment of beef production, the MPS component would be estimated as the product of the price gap and the farm output of manufacturing quality beef.

Depending on the definition of low quality or manufacturing beef, adding one or more segments to the production of cow beef would generate alternative estimates of the production of manufacturing beef (at the farm level). For example, production of bulls and trimmings from high-quality carcasses might be added to the production of cow beef. By the same token, one part of the production of cow beef might be subtracted from the total: that part of cow beef production that enters the high-quality market.

Production of cow beef accounts for about 18 percent of all beef production (measured at the farm level) in Canada (see Table 2). The production of boneless manufacturing beef from steer, heifer and cow carcasses has been estimated to about 25 percent of total Canadian beef production.[12] The share of low quality beef in the total production of low quality and high quality inspected beef in Canada amounts to about 39 percent, while counting also the share of low quality beef in Canada's exports of cattle brings the share of low quality production to about 41 percent.[13]

9.b. Transfer Related to the Import Tariff

The protection, and any associated transfer to producers, that results from the import tariff of $44.1 per tonne is part of the observed price gap used to estimate MPS for the cow beef segment. However, in certain circumstances this tariff would also indicate a price gap to be applied to the rest of the beef sector (the non-cow-beef segment). The transfer to the non-cow-beef segment would be evaluated as the tariff rate (possibly adjusted to account for the actual tariff applied to imports from different countries) multiplied by production of all beef other than cow beef. This transfer would be added to the MPS for cow beef to generate a total MPS for the whole beef sector in Canada. The corresponding reasoning and procedure would apply if the MPS

related to the MIA was based on the manufacturing quality segment rather than the cow beef segment.

A decision would need to be made on whether to estimate a tariff-based MPS component for that part of beef production to which the cow-beef price gap is not applied. Following what appears to be a rule of thumb for OECD PSE, this decision would take into account Canada's net trading status in the commodity in question. For a commodity in which Canada is a net exporter, the tariff would not give rise to a policy transfer to producers - if a net importer it would. In this case it is not clear whether it is Canada's trading status in all beef or its trading status in non-manufacturing or non-cow beef that would be decisive.

There is evidence that Canada was a net exporter of all beef (dressed and live beef and veal, carcass equivalent) between 1986 and 1991, except in 1987.[14] Therefore no tariff-related MPS component would be counted for any segment of Canadian beef production. (The year 1987 would be the exception unless a smoothing rule was employed to avoid frequent year-to-year changes in accounting for MPS components).

Canada appears to have been a continuous net exporter of high-quality (non-manufacturing) beef between 1986 and 1991 (except in 1987) (Huang and Krakar, 1991).[15] Thus no tariff-based MPS component would be counted for that segment of beef production. If Canada also was a net exporter of non-cow beef in those years, no tariff-based MPS component would be attributed to the non-cow-beef segment either.

### 9.c. Alternative Estimates of MPS

Table 3 shows estimates of MPS based on a price gap for cow beef applied to three different levels of production. Row (A) refers to production of all beef (this is the OECD estimate). Row

(D) refers to production of cow beef as derived in Table 2. Row (G) provides an illustration of the magnitude of MPS under the assumption that manufacturing beef amounts to 41 percent of the meat equivalent of farm output of cattle and calves.[16]

The difference between MPS according to the OECD method (row A) and the segmented market methods (rows D and G) is explained by the elimination of the cow-beef related price gap component for about 82 and 59 percent, respectively, of Canadian production. Consequently, where the OECD method indicates $1,084 mill. in 1987, the cow-beef segment method indicates only $165 mill. MPS related to a 41 percent manufacturing quality segment amounts to $380 mill.

MPS estimates are also expressed in Table 3 as unit MPS (in dollars per tonne) and as a percentage of a value of production measure.[17] The relative magnitudes of these estimates mirror those of the estimates of total MPS.

Table 3 also shows the size of an MPS component calculated as the product of the import tariff and the level of production of (J) non-cow beef, and (K) non-manufacturing beef, and the result of adding this component to rows D and G. The total MPS would increase at most by about $30-40 mill. (rows J and K). This amount is relatively small because the tariff rate is so much smaller than the price gap based on a comparison of cow prices in Canada and New Zealand. Given evidence that Canada was a net exporter of the relevant commodities in the period concerned, estimates in rows L and M should be regarded as maximum indicators only of "what would happen if...".

## 10. Alternative PSE Estimates and Similar Measures

Table 4 shows the results of incorporating various MPS estimates for the beef sector in Canada in the calculation of

OECD PSE. The PSE estimation underlying these results is that carried out in 1992 (OECD, 1992a; OECD, 1992b).[18] (See Table 1.e.) The PSE estimate is obtained by replacing the data in the row "Trade measures" in Table 1.e. with the MPS estimate from one of rows A, D, or G in Table 3. Table 4 also shows two other measures of transfers to the beef sector in Canada, viz., the USDA PSE and Net Benefits.

The following features stand out in Table 4. Total PSE based on the segmented market methods are substantially lower than with the OECD method. Total PSE according to the OECD method averaged $1,445 mill. in the years 1986 to 1991. Among the two segmented market methods, the simple cow-beef segment method gives a total PSE averaging $650 mill. in 1986-91., compared to an average of $840 mill. using a 41 percent manufacturing segment for calculating MPS.

Measured in unit PSE, the OECD method yields an average of $1,333 per tonne, the cow beef only method $598 per tonne, and the manufacturing segment method $774 per tonne.

The unit PSE according to the segmented market methods is higher than the unit PSE according to the USDA estimation (in 1986 and 1987 - the only years for which USDA estimates are published). This result largely reflects the fact that the USDA method does not account for any price gap (other than the import tariff) even for the cow-beef segment of the market.

Percentage PSEs for in the OECD method and the two segmented market methods show the same pattern, compared to the USDA estimate.

Net Benefits, in which no price gap from either the existence of the MIA or the import tariff is counted, show PSEs that are slightly lower than those of the USDA. This may partly

be explained by the negative net benefit element arising out of policies such as the Western Grain Transportation Act and the Canada Shipping Act: these negative elements are not entered in the USDA estimation.[19]

## 11. Alternative Estimates of PSE for Beef in the U.S

### 11.a. PSE for the U.S. Based on MPS for Manufacturing Beef

The OECD PSE for beef in the U.S. is estimated using the same method as for beef in Canada: the New Zealand based price gap is multiplied by total beef production. Without going into an analysis of the size of various segments of the U.S. beef market, an attempt is made here to see what the effect would be on the OECD PSE for beef in the U.S. if the price gap was multiplied by production of manufacturing beef only.

It is assumed that manufacturing beef accounts for 41 percent of the meat equivalent of farm output in the U.S.[20] Consequently, the MPS component of the OECD PSE for U.S. beef is reduced to 41 percent of the amount currently used in the OECD estimation. The effect on the net total PSE is a decline from an average of US$9,368 mill. to an average of US$4,976 in 1986-91. The net unit PSE correspondingly declines by almost half.

Reducing the MPS component in the OECD PSE estimation for beef in the U.S. by 59 percent of course also reduces the percentage PSE substantially. Instead of averaging 35 percent in the 1986-91 period, the percentage PSE following the reduction of MPS averages about 19 percent. This level of percentage PSE is still noticeably below the percentage PSE estimated for Canada (25 percent) under the same assumption about the share of manufacturing beef in total beef output at the farm level.

## 11.b. Alternative Beef Price Series in PSE for the U.S.

The OECD PSE estimates published for beef in the U.S. are based on a domestic beef price called "Utility Cow, Omaha adjusted to a New York basis, carcass equivalent" (OECD, 1989b. See also Table 1.c).[21] It is not possible to replicate this series with the references given. For example, the size and direction of the transport cost adjustment between Omaha and New York are not shown, nor is the dressing percentage.

In order to make the PSE estimations of beef in Canada and the U.S. more comparable than what appears to be the case for the published OECD estimates, a series of yearly prices for "Boning Utility" cows in Omaha is substituted for the series underlying the OECD estimates for 1979-86 (see Annex 2). This grade of cow is chosen because some beef market analysts consider the U.S. boning utility cow to be the grade most closely corresponding to the D3-5 cow used for the domestic price in OECD PSE for Canada. No transportation cost is added to or subtracted from the Omaha price (this is in line with how domestic transport costs are treated for most commodities in most other countries). A dressing percentage of 49 percent for cow beef in the U.S. is assumed. The resulting prices of cow beef in the U.S. (see Annex 2) are about 10 percent higher than the prices used in MPS in OECD PSE for 1979-86 (see Table 1.c, row d).

Incorporating the series described above in MPS and PSE calculations for the U.S. (such as those in Tables 1.c and 1.f) for 1979-86 increases the MPS component of PSE by about US$1,700 mill. per year. The average net total PSE for the period 1979-86 increases from US$7,809 mill. to US$9,467 mill., while the net unit PSE increases by almost US$160 per tonne.

The average net percentage PSE for the 1979-86 period increases from 34 percent to 41 percent (7 percentage points) as

a result of using the alternative price series for cow beef in the U.S. For Canada, the average net percentage PSE for the period 1979-86 is 32 percent (derived from Table 1.e). Using comparable series for the domestic price of cow beef in the two countries thus raises the percentage PSE for the U.S. from a level close to Canada's to a level considerably higher.

For the period 1987-91, for which detailed MPS calculations for the U.S. are not published, OECD PSE estimates for beef in the U.S. are several percentage points lower than the estimates for Canada.[22] If the 1987-91 beef PSE estimates for the U.S. are based on the same series for cow beef in the U.S. as that used for the 1979-86 period, replacing it with a series more comparable to the price series used for cow beef in Canada would result in a corresponding increase in PSE for beef in the U.S. Such an increase could offset part or all of the difference in PSE between Canada and the U.S. or perhaps even exceed the difference.

The above calculations refer to the approach of applying a price gap to the whole beef market. However, the same reasoning could be extended to the estimation of MPS only for the cow beef or manufacturing segment of beef production, with allowance for possible differences between the two countries in the share of this segment in each country's total beef production. Using comparable series for the domestic price of cow beef in the U.S. and Canada (i. e., increasing the price gap in the U.S.) will yield PSE estimates that are considerably more equal in the two countries.

Estimating MPS for only the manufacturing segment of beef production in Canada and the U.S. results in lower PSE for both countries than those estimated by the OECD. Additionally, using a domestic price series for cow beef in the U.S. that is comparable with the domestic series used for Canada increases the

PSE estimate for the U.S. to a level that is close to the estimate for Canada.

## 12. Summary and Conclusions

PSE as estimated by, inter alia, the OECD and the USDA, is a measure of transfers to producers. The measure incorporates both transfers in the form of government expenditures and in the form of regulated prices maintained with the help of policy instruments such as import barriers. The transparency provided by PSE (or similar) methods and estimates is increasingly drawn upon in policy analysis, both domestically and internationally.

The policy categories represented in OECD PSE are market price support (based on an estimated or observed gap between a domestic price and a border price), direct payments (such as stabilization payments in Canada), reduction of input costs (such as credit concessions), general services (e.g., government expenditure on agricultural research), and sub-national (provincial government expenditures in Canada). Other measures, such as USDA PSE, incorporate more or less the same set of policies, although some exceptions do occur and the method of estimating the transfer under a given policy may differ.

OECD PSE estimates published so far are based on a price gap between the prices of cow beef in Canada and in New Zealand. This gap is extended to the whole Canadian beef sector, i.e., including the high-quality or non-cow beef segment. This method, based on the assumption that any policy instruments generating transfers to the cow beef segment of the Canadian beef sector generate corresponding transfers to the high-quality segment, results in a substantially larger PSE estimate than if only a transfer to the cow beef or manufacturing quality segment had been recognized. Canada has not accepted the method underlying OECD PSE estimates.

Alternative estimates of PSE for beef in Canada in 1986-91 are made to illustrate the sensitivity of the estimates to alternative assumptions about the size of the segment benefiting from the existence of the Meat Import Act - the major policy instrument assumed to cause a price gap for beef in Canada. Estimates of any transfer that might result from Canada's import tariff on beef are also made. Depending on Canada's status as a net importer or net exporter of beef, or various quality segments of beef, the transfer arising from the import tariff might be added to the transfer attributed in the OECD method mainly to the existence of the Meat Import Act.

Segmenting the Canadian beef sector and applying a price gap to only the cow beef or manufacturing segment amounts to using a North American reference price for the non-cow-beef or high-quality segment, respectively (i.e., no price gap is observed). The PSE for the beef sector in Canada, when applying the price gap to the cow beef segment only (18 percent of production) is somewhat less than one-half of the OECD PSE estimate. When applying the price gap to a manufacturing beef segment only (41 percent of production), the PSE for Canada's beef sector is somewhat more than one-half of the OECD estimate.

Applying the segmenting method to the OECD PSE for beef in the U.S. would result in correspondingly lower estimates for that country also. As long as the currently used domestic cow price in the U.S. continued to be used, the unit and percentage PSE estimates for beef in the U.S. would continue to be below the estimates for Canada.

If a higher domestic cow price were used in the OECD estimation of MPS (and PSE) for beef in the U.S. (reflecting a grade of cow comparable to that used in the estimate for Canada and without accounting for any transportation cost from Omaha to New York), the OECD PSE estimate for beef in the U.S. would

increase. The increase resulting from such an adjustment could amount to about 7 percentage points in the percentage expression of net PSE in the case of the non-segmented beef market approach. This would put unit PSE and percentage PSE at very similar levels in Canada and the U.S.

The OECD is reviewing ways in which PSE for beef could be estimated on the basis of data that represent distinct market segments. In the OECD, Canada has supported the development of improved methods and data for estimating PSE, in the expectation that problems such as those examined in this paper will be resolved. Basing PSE estimates on realistic and consistent methods and data would facilitate interpretation of the estimates and improve the transparency of policy sets applied in different countries.

**Endnotes**

1. OECD estimates refer to "beef and veal". For ease of presentation, in this paper "beef" includes "veal" unless otherwise specified. The terms "low quality" and "manufacturing" beef are used interchangeably.

2. This definition from Cahill and Legg (1990) carries a footnote explaining the shift from earlier definitions based on a concept of compensation to producers if agricultural policies were removed.

3. The principal author of the FAO papers was Professor Timothy Josling, now at Stanford University, in collaboration with, in particular, Jimmye Hillman and T. Earley. While the FAO papers did make PSE estimates for Canada, beef was not one of the sectors studied. Neither was beef among the sectors studied somewhat later in Canada by Josling (1981).

4. Other important features of these studies, aiming at consistency among countries and commodities, were the use of Consumer Subsidy Equivalents (a measure of the transfers from domestic consumers to producers and taxpayers resulting from agricultural polices at a given time) and a set of explicit principles against which countries' policies were evaluated (OECD, 1989c). - Cahill and Legg (1990) point out a number of qualifications and assumptions underlying PSEs. These authors also emphasize that "...the degree of comparability of PSEs across countries and commodities must be treated with caution." (p. 27).

5. Cahill and Legg (1990) do not break out "Sub-national" explicitly. However, this category is explicit in OECD's PSE tables (e.g., OECD, 1990b).

6. See Cahill and Legg (1990) for a discussion of some of the qualifications attaching to this method.

7. In the original country study on Canada (OECD, 1987a), which estimated PSE for 1979-81, there was no PSE component attributed to the existence of the MIA. The reason appears to have been that the MIA was enacted only in late 1981 (OECD, 1987a, p. 76). While the MIA was not seen as giving rise to a PSE component in the 1988 Monitoring Report (OECD, 1988), the estimates appearing in the 1989 Report do attribute a part of transfers to the existence of the Meat Import Law (sic) (OECD, 1989c, p. 92).

**8.** The $44.1 per tonne (4.41 ¢ per kg carcass weight) is the Most Favoured Nation (MFN) rate. Since the inception of the Free Trade Agreement with the U.S. in 1989, most tariffs on imports of cattle, beef, and bovine by-products from the U.S. have been phased down or out. For simplicity, and because already the MFN tariff rate is small in relation to the price of beef in international trade, the discussion in this paper ignores the reduced rate or absence of tariffs on imports from the U.S. in the most recent years

**9.** See Tables 1.a. and 1.c. for an outline of the MPS estimation procedure for Canada and the United States, respectively. Tables 1.b. and 1.d. show how the MPS estimates are entered in OECD PSE estimation. OECD PSE estimates for Canada published in recent years (table 1.e.) incorporate MPS estimates based on data that are revised and updated from those shown in Tables 1.a. and 1.b. In the case of the U.S., recently published PSE estimates (Table 1.f.) incorporate the same data as in Tables 1.c. and 1.d. - In Table 1.a., the statement that the factor 1.82 has been used to convert live weight to carcass weight of cows is incorrect - the factor 2.04 has been used. For 1986 (and later years) the domestic cow price refers to D3 Winnipeg. The price of the New Zealand product refers to a cow in fat class M (fat cover less than 1 mm), i.e., the lowest fat class identified for New Zealand export beef (New Zealand Meat Producers Board, 1988).

**10.** For livestock drought programs that are cost-shared between the federal and provincial governments, only the federal portion is usually shown in Direct Payments. The portion attributable to provincial governments is counted under "Sub-national".

**11.** OECD PSE estimates (OECD, 1992b; OECD,1990b; OECD,1989d; OECD, 1989a) do not show commodity-specific details of the transfers that make up the category Reduction of Input Costs. Details are shown only in a table such as Table 13 - Detail of General Policy Measures - Aggregate of All Commodities 1979 to 1991 (OECD, 1992b), but not at the level of individual commodities. The discussion in this paper uses unpublished Agriculture Canada tabulations underlying OECD PSE estimates. These tabulations have been and are still undergoing revisions. Consequently, the corresponding components of OECD PSE are subject to change as revisions are incorporated.

**12.** Canadian International Trade Tribunal (1991), Table 14. Over the period 1981 to 1990, total production of boneless manufacturing beef ranged between 22.2 and 27.2 percent of total Canadian beef production, with an average of 24.5 percent. The CITT definition of "boneless manufacturing beef" is not necessarily the same as any of the measures of the manufacturing beef segment used in this paper.

**13.** The definition of low quality beef in this estimate is that used in Agriculture Canada (1991). It defines low quality beef as 100 percent of carcasses of cows and bulls, plus 22.45 percent of carcasses of steers and heifers. No account is taken of uninspected slaughter or of slaughter or exports of calves. Recognizing that some parts of cow carcasses enter the high quality market would reduce the estimate correspondingly. The data (1979-1991) underlying the estimates 39 percent and 41 percent are shown in Annex 1.

**14.** Agriculture Canada, Agri-Food Policy Analysis Division, unpublished tabulations, December, 1992, based on data from Statistics Canada, Catalogue 23-203, "Livestock and Animal Products Statistics".

**15.** This estimate of trading status in high-quality beef refers to the sum of Canada's net exports to all countries of high-quality beef and live cattle and calves (in carcass weight). High-quality beef is defined with reference to product categories in Canada's trade statistics and the unit values of exports and imports in these categories. Trade in the following live animal categories is counted: steers, heifers, feeders, and calves. Live weight is converted to carcass weight using category-specific dressing percentages (hypothetical percentages for feeders and calves). The data are from Statistics Canada and Agriculture Canada's Market Information Service.

**16.** The estimate of 41 percent is that derived in Annex 1, applied here to the meat equivalent of farm output of cattle and calves in Canada. See also endnote 13. Further analysis is required to establish the shares to be used for cow beef or manufacturing beef production for each year in OECD PSE for Canada.

**17.** It should be noted that the denominator in the percentage expression is "farm cash receipts" (less interprovincial exports). While this is the same denominator as the one shown in the calculation of **MPS** in the OECD's methodology update (OECD, 1989a, Table B), it is conceptually different from the denominator in the expression of percentage **PSE**. Percentage PSE is based on an adjusted value of production, where the adjustment refers to the addition of the policy transfer counted in PSE in the category "Direct Payments".

**18.** The results for 1991 are estimates and those for 1992 are provisional. The data underlying OECD calculations are undergoing review and update, resulting in ongoing revisions of the PSE estimates.

**19.** In OECD PSE estimates, the feed cost increase caused by the Western Grain Transportation Act is counted in the excess feed

cost component (see Section 4.a). Effects of the Canada Shipping Act are ignored.

**20.** This assumed share is the same as the illustrative estimate used for Canada in this paper. Some observers indicate that the fed beef share of total beef production in the U.S. is larger than the corresponding share in Canada (possibly related to a larger share of beef animals in the cattle herd in the U.S. than in Canada).

**21.** The same data for 1979-86 for producer price, level of production, and market price support are shown in OECD (1992b).

**22.** The yearly difference between net percentage PSE in Canada and in the U.S. (Tables 1.e. and 1.f.) averages about 7-8 percentage points in the period 1987-91.

## List of Abbreviations

| | |
|---|---|
| ASA | Agricultural Stabilization Act |
| AMS | Aggregate Measure of Support |
| CSE | Consumer Subsidy Equivalent |
| FAO | Food and Agriculture Organization of the United Nations |
| GATT | General Agreement on Tariffs and Trade |
| MIA | Meat Import Act |
| MFN | Most Favoured Nation |
| MTM | OECD Ministerial Trade Mandate |
| MPS | Market Price Support (component of OECD PSE) |
| NTSP | National Tripartite Stabilization Program |
| OECD | Organization for Economic Cooperation and Development |
| PSE | Producer Subsidy Equivalent |
| USDA | United States Department of Agriculture |

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Table B

CALCULATION OF MARKET PRICE SUPPORT COMPONENT FOR BEEF : CANADA

| | UNITS | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|
| a. Producer price | C$/T | 3131.0 | 3221.0 | 3039.0 | 2835.0 | 2826.0 | 2991.0 | 3218.0 | 2984.2 |
| b. Level of production | '000 T | 1005.0 | 1022.0 | 1015.0 | 1080.0 | 1075.0 | 1057.0 | 1085.0 | 1073.0 |
| c. Value of production | C$ Mio | 3146.7 | 3291.9 | 3084.6 | 3061.8 | 3038.0 | 3161.5 | 3491.5 | 3202.0 |
| d. Domestic cow price (D3-5 Winnipeg) | C$/T | 2488.2 | 2268.8 | 2019.2 | 1921.2 | 1995.8 | 2046.2 | 2073.2 | 2156.4 |
| e. New-Zealand cow price (m-cow) | NZ$/T | 1100.0 | 1000.0 | 877.0 | 1002.0 | 1306.0 | 1458.0 | 1924.0 | 1356.0 |
| f. Transport costs | NZ$/T | 315.0 | 399.0 | 379.0 | 397.0 | 397.0 | 412.0 | 552.0 | 546.0 |
| g. Exchange rate | C$/NZ$ | 1.1970 | 1.1385 | 1.0394 | 0.9257 | 0.8236 | 0.7329 | 0.6743 | 0.7249 |
| h. New-Zealand cow price (plus transport) | C$/T | 1693.8 | 1592.7 | 1305.5 | 1295.0 | 1402.7 | 1370.5 | 1669.6 | 1378.8 |
| i. Price difference (cow beef only) | C$/T | 794.4 | 676.1 | 713.7 | 626.2 | 593.1 | 675.7 | 403.6 | 777.6 |
| j. Price difference (all beef) | C$/T | 897.1 | 818.0 | 893.9 | 775.1 | 716.5 | 831.7 | 515.0 | 926.8 |
| k. MPS total | C$ Mio | 901.5 | 836.0 | 907.3 | 837.1 | 770.2 | 879.1 | 558.8 | 994.5 |
| l. MPS percentage | % | 28.7 | 25.4 | 29.4 | 27.3 | 25.4 | 27.8 | 16.0 | 31.1 |

NOTES AND SOURCES

a,b,c, See PSE Table No. 8

d. Slaughter cows D3-5 Winnipeg, converted to carcass weight equivalents using a factor of 1.82.

e. New Zealand M-cow in weight range 145.5 kg to 170 kg, years ending September minus 'supplements paid under various stabilisation schemes in order to arrive at an unassisted price.
Source: New Zealand Meat and Wool Boards' Economic Service.

f. Source: New Zealand Meat and Wool Boards' Economic Service.

g. Source: OECD Main Economic Indicators.

h. (e+f)*g

i. d-h

j. (i+(i/d*a))/2

k. j*b/1000

l. k/c*100



Table 1.a.
Source: Reproduced from OECD (1989a)

CANADA / CANADA

TABLE 8 / TABLEAU 8
BEEF AND VEAL / VIANDE BOVINE

PRODUCER SUBSIDY EQUIVALENTS / EQUIVALENTS SUBVENTION A LA PRODUCTION

| | | UNITS/ UNITES | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| I | Level of production | '000 T. | 1005 | 1022 | 1015 | 1080 | 1075 | 1057 | 1085 | 1073 | I Niveau de production |
| II | Producer price | C$ / T. | 3131 | 3221 | 3039 | 2835 | 2826 | 2991 | 3218 | 2984 | II Prix à la production |
| III | Value of production | C$ Mio. | 3147 | 3292 | 3085 | 3062 | 3038 | 3161 | 3492 | 3202 | III Valeur de la production |
| IV | Direct payments | C$ Mio. | 0 | 4 | 0 | 0 | 0 | 6 | 68 | 18 | IV Versements directs |
| V | Adjusted value of production | C$ Mio. | 3147 | 3296 | 3085 | 3062 | 3038 | 3167 | 3559 | 3220 | V Valeur corrigée de la production |
| | A. Market price support | C$ Mio. | 902 | 836 | 907 | 837 | 770 | 879 | 559 | 994 | A. Soutien des prix du marché |
| | 1. Trade measures | C$ Mio. | 902 | 836 | 907 | 837 | 770 | 879 | 559 | 994 | 1. Mesures relatives aux échanges |
| | 2. | C$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2. |
| | 3. | C$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3. |
| | 4. | C$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4. |
| | 5. | C$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5. |
| | 6. | C$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6. |
| | B. Direct payments | C$ Mio. | 0 | 4 | 0 | 0 | 0 | 6 | 68 | 18 | B. Versements directs |
| | 1. Deficiency paym.(ASB,Trip. | C$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 3 | 1. Compensatoires (ASB,Trip.) |
| | 2. Not based on output | C$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2. Non basés sur niveau de production |
| | 3. Disaster (drought,etc) | C$ Mio. | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 3. Calamités (sécheresse,etc) |
| | 4. Diversion | C$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4. Mise hors culture |
| | 5. Levies,fees | C$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5. Prélèvements,taxes |
| | 6. Other | C$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6. Autres |
| | 7. Other | C$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7. Autres |
| | 8. Other (disaster) | C$ Mio. | 0 | 0 | 0 | 0 | 0 | 6 | 50 | 15 | 8. Autres (calamités) |
| | C. Reduction of input costs | C$ Mio. | 17 | 19 | 15 | 14 | 16 | 26 | 49 | 54 | C. Réduction du coût des intrants |
| | D. General services | C$ Mio. | 94 | 105 | 96 | 131 | 141 | 162 | 170 | 156 | D. Services d'intérêt général |
| | E. Sub national | C$ Mio. | 228 | 213 | 248 | 275 | 232 | 252 | 327 | 349 | E. Niveau infra-national |
| | F. Other | C$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | F. Autres |
| VI | Gross total PSE | C$ Mio. | 1241 | 1177 | 1266 | 1257 | 1160 | 1325 | 1173 | 1571 | VI ESP total brut |
| VII | Gross unit PSE | C$ / T. | 1234 | 1152 | 1247 | 1164 | 1079 | 1253 | 1081 | 1464 | VII ESP unitaire brut |
| VIII | Gross percentage PSE | % | 39 | 36 | 41 | 41 | 38 | 42 | 33 | 49 | VIII ESP en pourcentage brut |
| IX | Excess feed cost | C$ Mio. | -55 | -64 | -56 | -38 | -39 | -37 | -95 | -75 | IX Surcoût alimentation animale |
| X | Net total PSE | C$ Mio. | 1186 | 1114 | 1210 | 1219 | 1121 | 1288 | 1078 | 1496 | X ESP total net |
| XI | Net unit PSE | C$ / T. | 1180 | 1090 | 1192 | 1129 | 1043 | 1218 | 994 | 1394 | XI ESP unitaire net |
| XII | Net percentage PSE | % | 38 | 34 | 39 | 40 | 37 | 41 | 30 | 46 | XII ESP en pourcentage net |

Table 1.b.
Source: Reproduced from OECD (1989a)

TABLE F CALCULATION OF MARKET PRICE SUPPORT COMPONENT FOR BEEF. UNITED STATES

| | UNITS | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
|---|---|---|---|---|---|---|---|---|---|
| a. Producer price | US$/T | 2652.5 | 2562.1 | 2312.4 | 2197.3 | 2070.5 | 2040.5 | 1933.0 | 1894.3 |
| b. Level of production | '000 T | 9800.0 | 9900.0 | 10300.0 | 10296.0 | 10632.0 | 10841.0 | 10907.0 | 11214.0 |
| c. Value of production | US$ Mio | 25994.5 | 25364.8 | 23817.7 | 22623.4 | 22013.6 | 22121.1 | 21083.2 | 21242.7 |
| d. Domestic cow price (New York carcass eq.) | US$/T | 2082.0 | 1871.0 | 1729.0 | 1605.0 | 1591.0 | 1591.0 | 1574.0 | 1507.0 |
| e. New-Zealand cow price (m-cow ) | NZ$/T | 1100.0 | 1000.0 | 877.0 | 1002.0 | 1306.0 | 1458.0 | 1924.0 | 1356.0 |
| f. Transport costs | NZ$/T | 315.0 | 399.0 | 379.0 | 397.0 | 397.0 | 412.0 | 552.0 | 546.0 |
| g. Exchange rate | US$/NZ$ | 1.0222 | 0.9736 | 0.8670 | 0.7505 | 0.6684 | 0.5659 | 0.4937 | 0.5218 |
| h. New-Zealand cow price (plus transport) | US$/T | 1446.4 | 1362.1 | 1089.0 | 1049.9 | 1138.2 | 1058.3 | 1222.4 | 992.4 |
| i. Price difference (cow beef only) | US$/T | 635.6 | 508.9 | 640.0 | 555.1 | 452.8 | 532.7 | 351.6 | 514.6 |
| j. Price difference (all beef) | US$/T | 722.7 | 602.9 | 748.0 | 657.5 | 521.0 | 608.0 | 391.7 | 580.7 |
| k. MPS total | US$ Mio | 7082.4 | 5968.7 | 7704.7 | 6769.8 | 5539.4 | 6590.9 | 4272.1 | 6512.5 |
| l. MPS percentage | % | 27.2 | 23.5 | 32.3 | 29.9 | 25.2 | 29.8 | 20.3 | 30.7 |

NOTES AND SOURCES :

a,b,c, See PSE Table No. 8

d. Utility Cow, Omaha adjusted to a New York basis, carcass equivalent.

e. New Zealand M-cow in weight range 145.5 kg to 170 kg, years ending September minus 'supplements' paid under various stabilisation schemes in order to arrive at an unassisted price.
Source: New Zealand Meat and Wool Boards' Economic Service.

f. Source: New Zealand Meat and Wool Boards' Economic Service.

g. Source: OECD Main Economic Indicators.

h. (e+f)*g

i. d-h

j. (i+(i/d*a))/2

k. j*6/1000

l. k/c*100



Table 1.c.
Source: Reproduced from OECD (1989b)

UNITED STATES / ETATS-UNIS

TABLE 8 / TABLEAU 8
BEEF AND VEAL / VIANDE BOVINE

PRODUCER SUBSIDY EQUIVALENTS / EQUIVALENTS SUBVENTION A LA PRODUCTION

| | | UNITS/ UNITES | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| I | Level of production | '000 T. | 9800 | 9900 | 10300 | 10296 | 10632 | 10841 | 10907 | 11214 | I Niveau de production |
| II | Producer price | US$ / T. | 2653 | 2562 | 2312 | 2197 | 2071 | 2041 | 1933 | 1894 | II Prix à la production |
| III | Value of production | US$ Mio. | 25995 | 25365 | 23818 | 22623 | 22014 | 22121 | 21083 | 21243 | III Valeur de la production |
| IV | Direct payments | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | IV Versements directs |
| V | Adjusted value of production | US$ Mio. | 25995 | 25365 | 23818 | 22623 | 22014 | 22121 | 21083 | 21243 | V Valeur corrigée de la production |
| | A. Market price support | US$ Mio. | 7082 | 5969 | 7705 | 6770 | 5539 | 6591 | 4272 | 6512 | A. Soutien des prix du marché |
| | 1. Market price support | US$ Mio. | 7082 | 5969 | 7705 | 6770 | 5539 | 6591 | 4272 | 6512 | 1. Soutien des prix du marché |
| | 2. | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2. |
| | 3. | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3. |
| | 4. | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4. |
| | 5. | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5. |
| | 6. | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6. |
| | B. Direct payments | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | B. Versements directs |
| | 1. Deficiency payments | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1. Compensatoires |
| | 2. Not based on output | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2. Non basés sur niveau de production |
| | 3. Disaster | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3. Calamités |
| | 4. Diversion | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4. Mise hors culture |
| | 5. Levies, fees | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5. Prélèvements, taxes |
| | 6. Other | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6. Autres |
| | 7. Other | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7. Autres |
| | 8. Other | US$ Mio. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8. Autres |
| | C. Reduction of input costs | US$ Mio. | 404 | 444 | 494 | 460 | 563 | 600 | 723 | 828 | C. Réduction du coût des intrants |
| | D. General services | US$ Mio. | 353 | 383 | 359 | 360 | 365 | 374 | 381 | 395 | D. Services d'intérêt général |
| | E. Sub national | US$ Mio. | 249 | 288 | 276 | 296 | 328 | 317 | 336 | 421 | E. Niveau infra-national |
| | F. Other | US$ Mio. | 247 | 258 | 244 | 253 | 215 | 199 | 208 | 207 | F. Autres |
| VI | Gross total PSE | US$ Mio. | 8336 | 7342 | 9078 | 8139 | 7010 | 8081 | 5920 | 8364 | VI ESP total brut |
| VII | Gross unit PSE | US$ / T. | 851 | 742 | 881 | 791 | 659 | 745 | 543 | 746 | VII ESP unitaire brut |
| VIII | Gross percentage PSE | % | 32 | 29 | 38 | 36 | 32 | 37 | 28 | 39 | VIII ESP en pourcentage brut |
| IX | Excess feed cost | US$ Mio. | -25 | -21 | -26 | -25 | -29 | -46 | -48 | -91 | IX Surcoût alimentation animale |
| X | Net total PSE | US$ Mio. | 8311 | 7321 | 9052 | 8114 | 6981 | 8035 | 5873 | 8273 | X ESP total net |
| XI | Net unit PSE | US$ / T. | 848 | 739 | 879 | 788 | 657 | 741 | 538 | 738 | XI ESP unitaire net |
| XII | Net percentage PSE | % | 32 | 29 | 38 | 36 | 32 | 36 | 28 | 39 | XII ESP en pourcentage net |

Table 1.d.
Source: Reproduced from OECD (1989b)

CANADA
BEEF AND VEAL

TABLE 7 / TABLEAU 7

CANADA
VIANDE BOVINE

PRODUCER SUBSIDY EQUIVALENTS

EQUIVALENTS SUBVENTION A LA PRODUCT

| | UNITS/ UNITES | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 (e) | 1991.0 (p) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I Level of production | '000 t | 1004.6 | 1029.3 | 1050.6 | 1100.3 | 1089.7 | 1087.3 | 1109.2 | 1081.5 | 1024.7 | 1101.5 | 1106.8 | 1137.3 | 1070.4 | I Niveau de production |
| II Producer price | C$/t | 3116.0 | 3182.8 | 2937.6 | 2783.1 | 2789.1 | 2960.9 | 2877.7 | 2934.6 | 3178.0 | 3096.0 | 3103.4 | 3117.7 | 3193.0 | II Prixa la production |
| III Value of production | C$ mn | 3130.4 | 3276.1 | 3086.2 | 3062.2 | 3039.4 | 3160.1 | 3192.0 | 3173.8 | 3256.7 | 3410.1 | 3435.0 | 3545.9 | 3417.7 | III Valeur de la production |
| IV Levies | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | IV Prelevements |
| V Direct payments | C$ mn | 0.0 | 3.7 | 0.1 | 0.0 | 0.0 | 3.2 | 53.3 | 13.2 | 2.7 | 191.1 | 36.0 | 14.4 | 18.8 | V Versements directs |
| VI Adjusted value of production | C$ mn | 3130.4 | 3279.8 | 3086.3 | 3062.2 | 3039.4 | 3163.3 | 3245.3 | 3187.0 | 3259.4 | 3601.2 | 3470.9 | 3560.3 | 3436.5 | VI Valeur corrigee de la productior |
| A. Market price support | C$ mn | 846.1 | 787.7 | 731.2 | 660.3 | 617.8 | 590.9 | 408.6 | 1004.0 | 1083.7 | 1224.5 | 654.1 | 745.7 | 931.6 | A. Soutien des prix du marche |
| 1. Trade measures | C$ mn | 846.1 | 787.7 | 731.2 | 660.3 | 617.8 | 590.9 | 408.6 | 1004.0 | 1083.7 | 1224.5 | 654.1 | 745.7 | 931.6 | 1. Mesures relatives aux echan |
| 2. | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2. |
| 3. | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3. |
| 4. | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4. |
| 5. | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5. |
| B. Levies | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | B. Prelevements |
| 1. Levies,fees | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15. Prelevements,taxes |
| C. Direct payments | C$ mn | 0.0 | 3.7 | 0.1 | 0.0 | 0.0 | 3.2 | 53.3 | 13.2 | 2.7 | 191.1 | 36.0 | 14.4 | 18.8 | C. Versements directs |
| 1. Deficiency paym. (ASA) | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.7 | 2.8 | 2.7 | 64.3 | 36.0 | 14.4 | 18.8 | 1. Compensatoires (ASA) |
| 2. Area & headage payments | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2. Paiements par ha et par anir |
| 3. Disaster (drought,etc) | C$ mn | 0.0 | 3.7 | 0.1 | 0.0 | 0.0 | 3.2 | 35.6 | 10.4 | 0.0 | 126.8 | 0.0 | 0.0 | 0.0 | 3. Calamites (secheresse,etc) |
| 4. Diversion | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4. Mise hors culture |
| 5. Other | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5. Autres |
| 6. Other | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6. Autres |
| 7. Other | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7. Autres |
| D. Reduction of input costs | C$ mn | 18.1 | 18.1 | 13.4 | 12.4 | 14.3 | 17.6 | 32.4 | 34.8 | 52.8 | 52.1 | 54.1 | 31.6 | 3.3 | D. Reduction du cout des intrant |
| E. General services | C$ mn | 84.8 | 95.4 | 84.8 | 115.2 | 127.6 | 147.6 | 152.6 | 154.1 | 163.0 | 169.3 | 182.4 | 198.9 | 219.7 | E. Services d'interet general |
| F. Sub national | C$ mn | 225.0 | 206.8 | 230.6 | 261.4 | 227.8 | 247.0 | 321.9 | 395.9 | 364.5 | 316.7 | 333.9 | 343.5 | 342.5 | F. Niveau infra – national |
| G. Other | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | G. Autres |
| VII Gross total PSE | C$ mn | 1174.0 | 1113.8 | 1060.1 | 1049.3 | 987.5 | 1006.4 | 968.9 | 1602.0 | 1666.8 | 1953.6 | 1260.5 | 1334.1 | 1515.9 | VII ESP total brut |
| VIII Gross unit PSE | C$/t | 1168.6 | 1082.1 | 1009.1 | 953.7 | 906.2 | 942.9 | 873.5 | 1481.3 | 1626.5 | 1773.6 | 1138.9 | 1173.0 | 1416.2 | VIII ESP unitaire brut |
| IX Gross percentage PSE | % | 37.5 | 34.0 | 34.3 | 34.3 | 32.5 | 31.8 | 29.9 | 50.3 | 51.1 | 54.2 | 36.3 | 37.5 | 44.1 | IX ESP en pourcentage brut |
| X Feed adjustment | C$ mn | −111.4 | −100.6 | −24.4 | −93.3 | −95.2 | −91.2 | −231.6 | −182.2 | −105.2 | −100.2 | −93.0 | −91.9 | −92.1 | X Ajustement alimentation animale |
| 1. Excess feed cost | C$ mn | −111.4 | −100.6 | −24.4 | −93.3 | −95.2 | −91.2 | −231.6 | −182.2 | −105.2 | −100.2 | −93.0 | −91.9 | −92.1 | 1. Surcout alimentation animale |
| 2. Other feed cost | C$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2. Autre alimentation animale |
| XI Net total PSE | C$ mn | 1062.6 | 1013.2 | 1035.7 | 956.1 | 892.3 | 915.2 | 737.3 | 1419.8 | 1561.6 | 1853.4 | 1167.5 | 1242.1 | 1423.8 | XI ESP total net |
| XII Net unit PSE | C$/t | 1057.7 | 984.3 | 985.9 | 868.9 | 818.8 | 857.5 | 664.7 | 1312.8 | 1523.9 | 1682.6 | 1054.8 | 1092.2 | 1330.1 | XII ESP unitaire net |
| XIII Net percentage PSE | % | 33.9 | 30.9 | 33.6 | 31.2 | 29.4 | 28.9 | 22.7 | 44.6 | 47.9 | 51.5 | 33.6 | 34.9 | 41.4 | XIII ESP en pourcentage net |

e : estimate
p : provisional

e : estimation
p : provisoire



Table 1.e.
Source: OECD (1992b)

UNITED STATES
BEEF AND VEAL

TABLE 7 / TABLEAU 7

ETATS-UNIS
VIANDE BOVINE

PRODUCER SUBSIDY EQUIVALENTS

EQUIVALENTS SUBVENTION A LA PRODUCT

| | UNITS/ UNITES | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 (e) | 1991.0 (p) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I Level of production | '000 t | 9800.0 | 9900.0 | 10300.0 | 10298.0 | 10632.0 | 10641.0 | 10907.0 | 11214.0 | 10884.1 | 10879.5 | 10633.2 | 10464.5 | 10557.5 | I Niveau de production |
| II Producer price | US$/t | 2652.5 | 2562.1 | 2312.4 | 2197.3 | 2070.5 | 2040.5 | 1933.0 | 1894.3 | 2275.4 | 2501.9 | 2636.1 | 2916.5 | 2786.2 | II Prix a la production |
| III Value of production | US$ mn | 25994.5 | 25364.8 | 23817.7 | 22623.4 | 22013.8 | 22121.1 | 21083.2 | 21242.7 | 24765.8 | 27219.9 | 28030.8 | 30519.4 | 29415.4 | III Valeur de la production |
| IV Levies | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | IV Prelevements |
| V Direct payments | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 800.0 | 0.0 | 0.0 | 0.0 | V Versements directs |
| VI Adjusted value of production | US$ mn | 25994.5 | 25364.8 | 23817.7 | 22623.4 | 22013.8 | 22121.1 | 21083.2 | 21242.7 | 24765.8 | 28019.9 | 28030.8 | 30519.4 | 29415.4 | VI Valeur corrigee de la productior |
| A. Market price support | US$ mn | 7082.4 | 5968.7 | 7704.7 | 6769.8 | 5539.4 | 6590.9 | 4272.1 | 6512.5 | 7245.6 | 8648.5 | 6780.5 | 7055.2 | 8271.5 | A. Soutien des prix du marche |
| 1. Market price support | US$ mn | 7082.4 | 5968.7 | 7704.7 | 6769.8 | 5539.4 | 6590.9 | 4272.1 | 6512.5 | 7245.6 | 8648.5 | 6780.5 | 7055.2 | 8271.5 | 1. Transport (crow) |
| 2. | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2. Systeme de double prix |
| 3. | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3. Programme cereales fourrag |
| 4. | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4. Compte de mise en commur |
| 5. | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5. |
| B. Levies | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | B. Prelevements |
| 1. Levies,fees | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15. Prelevements,taxes |
| C. Direct payments | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 800.0 | 0.0 | 0.0 | 0.0 | C. Versements directs |
| 1. Deficiency payments | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1. Compensatoires (ASB,etc.) |
| 2. Area & headage payments | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2. Paiements par ha et par anir |
| 3. Disaster | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 800.0 | 0.0 | 0.0 | 0.0 | 3. Calamites (assurance recolte |
| 4. Diversion | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4. Indemnisation a titre d'emba |
| 5. Other | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5. Autres (LSGO & remise de d |
| 6. Other | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6. Autres(PSCC,PARB,ETC.) |
| 7. Other | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7. Autres(calamites) |
| D. Reduction of input costs | US$ mn | 411.0 | 443.2 | 493.7 | 490.5 | 717.7 | 742.6 | 729.9 | 729.4 | 836.4 | 884.6 | 805.6 | 835.1 | 845.5 | D. Reduction du cout des intrant |
| E. General services | US$ mn | 360.4 | 383.3 | 359.1 | 360.5 | 365.1 | 373.2 | 386.7 | 405.5 | 454.5 | 504.7 | 503.2 | 490.8 | 614.5 | E. Services d'interet general |
| F. Sub national | US$ mn | 256.7 | 287.7 | 275.7 | 297.4 | 328.6 | 317.3 | 345.5 | 411.8 | 459.0 | 408.4 | 470.0 | 492.0 | 498.1 | F. Niveau infra-national |
| G. Other | US$ mn | 254.3 | 258.4 | 244.1 | 254.9 | 214.9 | 199.2 | 213.3 | 221.7 | 130.4 | 104.6 | 140.5 | 110.2 | 108.6 | G. Autres |
| VII Gross total PSE | US$ mn | 8364.8 | 7341.4 | 9077.3 | 8173.2 | 7165.7 | 8223.1 | 5647.5 | 8280.9 | 9125.9 | 11350.7 | 8699.8 | 8963.2 | 10338.3 | VII ESP total brut |
| VIII Gross unit PSE | US$/t | 853.6 | 741.6 | 881.3 | 793.8 | 674.0 | 758.5 | 545.3 | 738.4 | 838.5 | 1043.3 | 818.2 | 858.4 | 979.2 | VIII ESP unitaire brut |
| IX Gross percentage PSE | % | 32.2 | 28.9 | 38.1 | 36.1 | 32.6 | 37.2 | 26.2 | 39.0 | 36.8 | 40.5 | 31.0 | 29.4 | 35.1 | IX ESP en pourcentage brut |
| X Feed adjustment | US$ mn | 0.0 | 0.0 | -0.0 | -0.0 | -0.1 | -0.1 | -8.5 | -89.5 | -129.8 | -24.7 | -12.8 | -54.3 | -258.9 | X Ajustement alimentation animale |
| 1. Excess feed cost | US$ mn | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -8.5 | -28.1 | -66.0 | -16.7 | -7.6 | -25.3 | -219.0 | 1. Surcout alimentation animale |
| 2. Other feed cost | US$ mn | 0.0 | 0.0 | -0.0 | -0.0 | -0.1 | -0.1 | -0.1 | -61.4 | -61.8 | -8.0 | -5.3 | -29.0 | -39.9 | 2. Autre alimentation animale |
| XI Net total PSE | US$ mn | 8364.8 | 7341.4 | 9077.3 | 8173.2 | 7165.6 | 8223.0 | 5638.9 | 8191.3 | 8996.2 | 11326.0 | 8687.0 | 8928.9 | 10079.4 | XI ESP total net |
| XII Net unit PSE | US$/t | 853.6 | 741.6 | 881.3 | 793.8 | 674.0 | 758.5 | 544.5 | 730.5 | 826.5 | 1041.0 | 817.0 | 853.3 | 954.7 | XII ESP unitaire net |
| XIII Net percentage PSE | % | 32.2 | 28.9 | 38.1 | 36.1 | 32.6 | 37.2 | 26.2 | 38.6 | 36.3 | 40.4 | 31.0 | 29.3 | 34.3 | XIII ESP en pourcentage net |

e : estimate
p : provisional

e : estimation
p : provisoire



Table 1.f.
Source: OECD (1992b)

Table 1.g.

## Canada PSE's--continued

| Item | Units | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|---|---|
| **Beef and veal** | | | | | | | |
| **Level of production (total)** | **1000 tons** | **1,108** | **1,096** | **1,074** | **1,112** | **1,026** | **1,033** |
| Domestically slaughtered | 1000 tons | 1,032 | 1,036 | 997 | 1,035 | 977 | 980 |
| Exported | 1000 head | 283 | 222 | 284 | 286 | 181 | 198 |
| Live export (carc. wgt. equiv.) | 1000 tons | 76 | 60 | 77 | 77 | 49 | 53 |
| **Producer price** | **Can$/ton** | **2,769** | **2,720** | **2,886** | **2,830** | **2,797** | **3,117** |
| Domestically slaughtered | Can$/ton | 2,800 | 2,737 | 2,909 | 2,842 | 2,800 | 3,111 |
| Live export (carc. wgt. equiv.) | Can$/ton | 2,353 | 2,421 | 2,594 | 2,666 | 2,739 | 3,225 |
| **Value of production** | **Mil. Can$** | **3,069** | **2,980** | **3,099** | **3,147** | **2,869** | **3,221** |
| **Direct payments (indicated by *)** | **Mil. Can$** | **0** | **0** | **10** | **32** | **47** | **1** |
| **Value to producers** | **Mil. Can$** | **3,069** | **2,980** | **3,109** | **3,180** | **2,917** | **3,223** |
| **Policy transfers to producers** | **Mil. Can$** | **274.4** | **271.6** | **314.9** | **374.6** | **356.8** | **314.3** |
| **Income support** | **Mil. Can$** | **0.0** | **0.0** | **9.8** | **32.4** | **47.4** | **1.5** |
| * ASA/tripartite payments | Mil. Can$ | 0.0 | 0.0 | 0.0 | 9.7 | 8.0 | 0.0 |
| * Financial assistance, other | Mil. Can$ | 0.0 | 0.0 | 9.8 | 22.7 | 39.4 | 1.5 |
| **Price intervention** | **Mil. Can$** | **45.2** | **45.6** | **43.7** | **45.4** | **45.7** | **43.1** |
| Tariff | Mil. Can$ | 45.2 | 45.6 | 43.7 | 45.4 | 45.7 | 43.1 |
| **Inputs assistance** | **Mil. Can$** | **5.8** | **6.3** | **6.8** | **6.2** | **5.8** | **7.1** |
| Feed freight subsidy | Mil. Can$ | 5.8 | 6.3 | 6.8 | 6.2 | 5.8 | 7.1 |
| **Marketing assistance** | **Mil. Can$** | **69.4** | **74.1** | **79.4** | **91.4** | **80.7** | **72.5** |
| Inspection services | Mil. Can$ | 66.9 | 71.4 | 74.7 | 88.4 | 78.4 | 70.0 |
| Marketing/promotion | Mil. Can$ | 2.5 | 2.7 | 4.7 | 3.0 | 2.3 | 2.5 |
| **Infrastructure support** | **Mil. Can$** | **66.6** | **71.4** | **82.0** | **74.4** | **75.3** | **61.7** |
| Development, structural | Mil. Can$ | 21.9 | 22.2 | 31.4 | 19.9 | 29.0 | 20.0 |
| Research and advisory | Mil. Can$ | 44.7 | 49.2 | 50.6 | 54.5 | 46.3 | 41.7 |
| **Regional support** | **Mil. Can$** | **87.4** | **74.2** | **93.2** | **124.8** | **101.9** | **128.4** |
| Provincial programs | Mil. Can$ | 87.4 | 74.2 | 93.2 | 124.8 | 101.9 | 128.4 |
| **PSE as ratio to producers' value** | **Percent** | **9** | **9** | **10** | **12** | **12** | **10** |
| **PSE per ton, in local currency** | **Can$/ton** | **248** | **248** | **293** | **337** | **348** | **304** |
| **PSE per ton, in US dollars** | **US$/ton** | **201** | **201** | **227** | **247** | **250** | **229** |
| **Commodity-specific exchange rate** | **Can$/US$** | **1.234** | **1.232** | **1.295** | **1.365** | **1.389** | **1.326** |

Continued--

Source: Reproduced from Webb et al. (1990)

United States PSE's--continued

Table 1.h.

| Item | Units | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|---|---|
| **Beef and veal** | | | | | | | |
| Level of production | 1000 tons | 10,425 | 10,748 | 10,928 | 10,996 | 11,292 | 10,884 |
| Producer price | $/ton | 2,170 | 2,048 | 2,026 | 1,928 | 1,854 | 2,263 |
| Reference price | $/ton | 2,126 | 2,004 | 1,982 | 1,884 | 1,810 | 2,219 |
| Value of production | Mil. $ | 22,623 | 22,014 | 22,146 | 21,197 | 20,935 | 24,629 |
| Direct payments (none apply) | Mil. $ | 0 | 0 | 0 | 0 | 0 | 0 |
| Value to producers | Mil. $ | 22,623 | 22,014 | 22,146 | 21,197 | 20,935 | 24,629 |
| Policy transfers to producers | Mil. $ | 1,630.5 | 1,660.1 | 1,715.4 | 1,880.1 | 2,601.0 | 2,397.9 |
| Price intervention | Mil. $ | 460.0 | 472.2 | 480.8 | 484.9 | 873.2 | 578.7 |
| Beef purchases | Mil. $ | 0.0 | 0.0 | 0.0 | 0.0 | 375.4 | 98.8 |
| Tariff | Mil. $ | 460.0 | 472.2 | 480.8 | 484.9 | 497.8 | 479.9 |
| Inputs assistance | Mil. $ | 266.2 | 278.0 | 347.6 | 483.7 | 693.4 | 777.6 |
| Emergency feed | Mil. $ | 6.0 | 0.0 | 0.0 | 0.1 | 0.3 | 32.5 |
| Farmers home administration | Mil. $ | 155.3 | 185.7 | 247.8 | 383.7 | 595.9 | 639.9 |
| Fuel excise tax | Mil. $ | 15.8 | 4.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Grazing fees | Mil. $ | 41.7 | 51.7 | 56.0 | 56.3 | 52.6 | 50.2 |
| Pest and disease control | Mil. $ | 47.5 | 36.4 | 43.9 | 43.6 | 44.6 | 55.0 |
| Marketing assistance | Mil. $ | 237.4 | 239.7 | 241.5 | 254.2 | 249.6 | 273.7 |
| Advisory | Mil. $ | 46.6 | 51.6 | 49.4 | 51.3 | 54.8 | 55.2 |
| Inspection | Mil. $ | 174.7 | 175.1 | 175.0 | 188.3 | 172.7 | 201.4 |
| Processing and marketing | Mil. $ | 16.1 | 13.0 | 17.1 | 14.7 | 22.1 | 17.1 |
| Infrastructure support | Mil. $ | 116.5 | 126.7 | 124.5 | 125.9 | 141.3 | 163.8 |
| Farm storage facility | Mil. $ | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Research | Mil. $ | 116.2 | 126.6 | 124.5 | 125.9 | 141.3 | 163.8 |
| Regional support | Mil. $ | 296.0 | 328.3 | 319.8 | 341.2 | 421.6 | 472.6 |
| State programs | Mil. $ | 296.0 | 328.3 | 319.8 | 341.2 | 421.6 | 472.6 |
| Economywide policies | Mil. $ | 254.4 | 215.3 | 201.2 | 190.2 | 221.8 | 131.4 |
| Taxation | Mil. $ | 253.7 | 214.7 | 200.7 | 189.7 | 221.5 | 131.0 |
| Transport | Mil. $ | 0.7 | 0.5 | 0.5 | 0.5 | 0.3 | 0.4 |
| PSE as ratio to producers' value | Percent | 7 | 8 | 8 | 9 | 12 | 10 |
| PSE per ton, in local currency | $/ton | 156 | 154 | 157 | 171 | 230 | 220 |
| PSE per ton, in US dollars | US$/ton | 156 | 154 | 157 | 171 | 230 | 220 |

Continued--

Source: Reproduced from Webb et al. (1990)

TABLE 2: BASIC DATA FOR BEEF MPS IN CANADA, 1986–1991.

| | | CALCULATION | UNITS | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
|---|---|---|---|---|---|---|---|---|---|
| | a. Estimated farm output, cattle (incl. cows) | | '000 head | 3691 | 3422 | 3584 | 3621 | – | – |
| | b. Average cold dressed weight | | kg | 281 | 286 | 294 | 291 | – | – |
| | c. Meat equivalent of farm output, cattle | a * b | '000 tonnes | 1035 | 978 | 1053 | 1054 | – | – |
| | d. Estimated farm output, calves | | '000 head | 637 | 588 | 587 | 611 | – | – |
| | e. Average cold dressed weight | | kg | 73 | 79 | 82 | 87 | – | – |
| | f. Meat equivalent of farm output, calves | d * e | '000 tonnes | 46 | 47 | 48 | 53 | – | – |
| g. | Level of production, cattle and calves | c + f | '000 tonnes | 1082 | 1025 | 1102 | 1107 | 1137 | 1071 |
| | h. Cow slaughter (fed. and prov. insp.) | | '000 head | 740 | 661 | 593 | 666 | 553 | 549 |
| | i. Live cow exports | | '000 head | 42 | 49 | 123 | 156 | 172 | 172 |
| | j. Total cow marketings | h + i | '000 head | 782 | 710 | 716 | 822 | 725 | 721 |
| | k. Average cold carcass weight | | lbs | 560 | 567 | 577 | 577 | 579 | 584 |
| | l. Average cold carcass weight | k / 2.20462 | kg | 254 | 257 | 262 | 262 | 263 | 265 |
| m. | Level of production, cows only | j * l | '000 tonnes | 199 | 183 | 187 | 215 | 191 | 191 |
| n. | Share of cow production in total | m/g*100 | % | 18 | 18 | 17 | 19 | 17 | 18 |
| o. | Level of production, manufacturing | 0.41 *g | '000 tonnes | 444 | 420 | 452 | 454 | 466 | 439 |
| | p. Farm cash receipts, cattle & calves | | '000 $ | 3557026 | 3763877 | 3923914 | 3938711 | 3982877 | 3839389 |
| | q. Interprovincial exports, cattle and calves | | '000 $ | 383192 | 507224 | 513807 | 503751 | 437002 | 421691 |
| r. | Value of production | (p – q) | C$ mill. | 3174 | 3257 | 3410 | 3435 | 3546 | 3418 |
| s. | Producer price | r / g | C$/tonne | 2934 | 3178 | 3096 | 3104 | 3118 | 3193 |
| t. | Domestic cow price (D3 Winnipeg) | | C$/tonne | 2156 | 2370 | 2434 | 2392 | 2573 | 2517 |
| | u. New–Zealand cow price (M–cow) | | NZ$/tonne | 1356 | 1622 | 1458 | 1968 | 2381 | 2167 |
| | v. Transport costs | | NZ$/tonne | 546 | 471 | 453 | 497 | 489 | 390 |
| | w. Exchange rate | | C$/NZ$ | 0.72 | 0.70 | 0.76 | 0.76 | 0.69 | 0.68 |
| x. | Reference price | (u + v ) * w | C$/tonne | 1370 | 1467 | 1455 | 1877 | 1980 | 1750 |
| y. | Price difference (cow beef only) | t – x | C$/tonne | 786 | 904 | 979 | 514 | 593 | 767 |
| z. | Price difference (all beef) | (y + (y/t*s))/2 | C$/tonne | 928 | 1058 | 1112 | 591 | 656 | 870 |

Sources and Notes: See next page

**Sources & Notes for Table 2 "Basic Data for Beef MPS in Canada, 1986-91"**

| | | |
|---|---|---|
| a,b,d,e: | 1986-89: | Statistics Canada, Livestock and Animal Products Statistics 1989, Catalogue 23-203, Table 6 "Cattle and Calves: Total Output and Slaughter, 1974-1989". |
| h,i,k: | 1986-91: | Agriculture Canada, Canada Livestock and Meat Trade Report (weekly), Vol. 73, Number 52-53, Table 1: "Low Quality (cow) Marketings Canada 1979-1992". |
| o: | | See text for factor 0.41. |
| p: | 1986-87: | Statistics Canada, Agriculture Economic Statistics, June 1990, Catalogue 21-603, Table "Farm Cash Receipts from Farming Operations". |
| | 1988: | Statistics Canada, Agriculture Economic Statistics, November 1990, Catalogue 21-603, Table "Farm Cash Receipts from Farming Operations". |
| | 1989-90: | Statistics Canada, Agriculture Economic Statistics, Catalogue 21-603, November 26, 1991 revisions |
| | 1991: | Agriculture Canada, Farm Income and Structure Division, Forecast December 23, 1991. |
| q: | 1986-89: | Statistics Canada, unpublished data, various release dates. |
| | 1990-91: | Statistics Canada, unpublished data, released February 7, 1992. |
| t: | 1986-87: | Agriculture Canada, Market Commentary, various issues. |
| | 1988-91: | Agriculture Canada, Market Commentary, December 1991, Table 10: "Cattle Prices and Feed Price Ratios, Canada and the United States". Note: Conversion factor from live to carcass weight: 2.04 (=49% dressing percentage). |
| u: | 1986-91: | New Zealand Meat and Wool Boards' Economic Service, various dates (data provided to the OECD Secretariat).New Zealand M-cow in weight range 145.5 kg to 170.0 kg (years ending September). "Supplements" paid under various stabilisation schemes have been subtracted in order to arrive at an unassisted price. |
| v: | 1986-91: | New Zealand Meat & Wool Boards' Economic Service, various dates (data provided to OECD Secretariat). |
| w: | 1986-91: | OECD Main Economic Indicators. C$/NZ$ derived from NZ$/US$ and C$/US$. (Note: NZ$/US$ exchange rates provided to OECD Secretariat for Canadian beef MPS in OECD (1992b) mistakenly refer to a different year than calendar year.) |

TABLE 3: MPS FOR THE BEEF SECTOR IN CANADA, 1986–1991.

| | CALCULATION | UNITS | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
|---|---|---|---|---|---|---|---|---|
| **"OECD" Method:** | | | | | | | | |
| A. MPS total | z*g/1000 | C$ mill. | 1004 | 1084 | 1225 | 654 | 746 | 932 |
| B. MPS unit | A/g*1000 | C$/tonne | 928 | 1058 | 1112 | 591 | 656 | 870 |
| C. MPS percentage | A/r*100 | % | 32 | 33 | 36 | 19 | 21 | 27 |
| **"Cows only" method:** | | | | | | | | |
| D. MPS total | y*m/1000 | C$ mill. | 156 | 165 | 183 | 111 | 113 | 147 |
| E. MPS unit | D/g*1000 | C$/tonne | 144 | 161 | 167 | 100 | 99 | 137 |
| F. MPS percentage | D/r*100 | % | 5 | 5 | 5 | 3 | 3 | 4 |
| **"Manufacturing (est.) only" method:** | | | | | | | | |
| G. MPS total | y*o/1000 | C$ mill. | 349 | 380 | 442 | 233 | 276 | 337 |
| H. MPS unit | G/g*1000 | C$/tonne | 322 | 370 | 401 | 211 | 243 | 315 |
| I. MPS percentage | G/r*100 | % | 11 | 12 | 13 | 7 | 8 | 10 |
| **Tariff component:** | | | | | | | | |
| J. MPS non–cow beef | (g–m)*44.09/1000 | C$ mill. | 39 | 37 | 40 | 39 | 42 | 39 |
| K. MPS non–manufacturing | (g–o)*44.09/1000 | C$ mill. | 33 | 32 | 34 | 34 | 35 | 33 |
| **Total MPS, incl. tariff component** | | | | | | | | |
| L. MPS "cows only" method | D+J | C$ mill. | 195 | 202 | 224 | 150 | 155 | 185 |
| M. MPS "manufacturing only" method | G+K | C$ mill. | 382 | 411 | 476 | 268 | 312 | 370 |

Sources: Table 2 (lower case letters refer to rows in Table 2).
Note: Rows G–M represent sample calculations to illustrate the order of magnitudes involved.

TABLE 4: PSE AND SIMILAR MEASURES FOR BEEF IN CANADA, 1986–91

| | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | Ave. |
|---|---|---|---|---|---|---|---|
| A. Total PSE ($ mill.) | | | | | | | |
| 1.– OECD | 1420 | 1562 | 1853 | 1168 | 1242 | 1424 | 1445 |
| 2.– Cow segment | 572 | 643 | 812 | 624 | 609 | 639 | 650 |
| 3.– Manufacturing segment | 765 | 858 | 1071 | 747 | 773 | 829 | 840 |
| 4.– USDA | 357 | 314 | n.a. | n.a. | n.a. | n.a. | n.a |
| 5.– Net benefits | n.a. | n.a. | n.a. | 309 | 311 | n.a. | n.a |
| B. Unit PSE ($/tonne) | | | | | | | |
| 1.– OECD | 1313 | 1524 | 1683 | 1055 | 1092 | 1330 | 1333 |
| 2.– Cow segment | 529 | 627 | 737 | 564 | 536 | 597 | 598 |
| 3.– Manufacturing segment | 707 | 837 | 972 | 675 | 680 | 774 | 774 |
| 4.– USDA | 348 | 304 | n.a. | n.a. | n.a. | n.a. | n.a |
| 5.– Net benefits | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a |
| C. Net percentage PSE (%) | | | | | | | |
| 1.– OECD | 45 | 48 | 51 | 34 | 35 | 41 | 42 |
| 2.– Cow segment | 18 | 20 | 24 | 18 | 17 | 19 | 19 |
| 3.– Manufacturing segment | 24 | 26 | 31 | 22 | 22 | 24 | 25 |
| 4.– USDA | 12 | 10 | n.a. | n.a. | n.a. | n.a. | n.a |
| 5.– Net benefits | n.a. | n.a. | n.a. | 10 | 9 | n.a. | n.a |

Sources: Rows 1–3: Table 3 and Table 1.e
Row 4: Webb et al.
Row 5: Committee of Experts 1991 a, b.
Net benefits are expressed per $100 of adjusted cash receipts.
This denominator is close to the adjusted value of production used in percentage PSE.

Note: n.a. = not available
Rows 1–3 refer to net PSE expressions.

**ANNEX 1**

## Selected Data for Beef in Canada, 1979-91

| Year | Production thous. tonnes | | Exports thous. tonnes | | Share percent | |
|---|---|---|---|---|---|---|
| | Low qual. A | High qual. B | Low qual. C | High qual. D | E= A/(A+B) | F= (A+C)/(A+B+C+D) |
| 1979 | 305.72 | 516.94 | 38.01 | 1.62 | 37 | 40 |
| 1980 | 320.96 | 528.66 | 38.50 | 3.59 | 38 | 40 |
| 1981 | 332.69 | 552.38 | 30.68 | 4.93 | 38 | 39 |
| 1982 | 354.05 | 543.99 | 48.75 | 10.64 | 39 | 42 |
| 1983 | 356.95 | 550.38 | 47.75 | 10.86 | 39 | 42 |
| 1984 | 354.74 | 512.83 | 44.49 | 23.33 | 41 | 43 |
| 1985 | 378.47 | 527.65 | 48.44 | 15.82 | 42 | 44 |
| 1986 | 366.46 | 540.63 | 28.21 | 24.17 | 40 | 41 |
| 1987 | 340.03 | 514.45 | 30.66 | 26.67 | 40 | 41 |
| 1988 | 326.68 | 522.64 | 61.70 | 55.91 | 38 | 40 |
| 1989 | 340.95 | 515.06 | 64.80 | 48.18 | 40 | 42 |
| 1990 | 305.98 | 497.77 | 110.60 | 79.06 | 38 | 42 |
| 1991 | 295.61 | 467.25 | 111.55 | 85.09 | 39 | 42 |
| | | | | Average | 39 | 41 |

Source: Calculated by Agriculture Canada, Economic Analysis Division, from data on exports, federally inspected slaughter, and average carcass weight in Agriculture Canada's "Canada Livestock and Meat Trade Report" (various issues). Annual data are simple averages of quarterly data. The low quality segment is 100% of slaughter (exports) of cows and bulls plus 22.45% of slaughter (exports) of steers and heifers.

**ANNEX 2**

## Selected Data on Prices of Cow Beef in the U.S.

| Year | US$/cwt. | US$/t | Year | US$/cwt. | US$/t |
|---|---|---|---|---|---|
| 1979 | 50.10 | 2,253 | 1986 | 37.19 | 1,672 |
| 1980 | 45.72 | 2,056 | 1987 | 44.80 | 2,015 |
| 1981 | 41.93 | 1,886 | 1988 | 47.94 | 2,156 |
| 1982 | 39.96 | 1,797 | 1989 | 49.51 | 2,226 |
| 1983 | 39.35 | 1,770 | 1990 | 54.74 | 2,462 |
| 1984 | 39.81 | 1,790 | 1991 | 50.29 | 2,262 |
| 1985 | 38.32 | 1,723 | 1992 | 44.84 | 2,017 |

Source: Selected Price Statistics for Meat Animals and Meat, "Livestock, Meat, Wool Market News", Weekly Summary and Statistics, Agricultural Marketing Service, U.S. Department of Agriculture, various issues.

Note: Yearly unweighted average of monthly data. Data refer to cows, Omaha, boning utility (data for 1991 and 1992 refer to cows, Sioux Falls, boning utility). Conversion factors: 22.046 cwt/tonne; 1/2.04 = 49% dressing percentage. The same data are published through 1987 for the grade Utility cow in U.S. Department of Agriculture (1989), Table 115.