



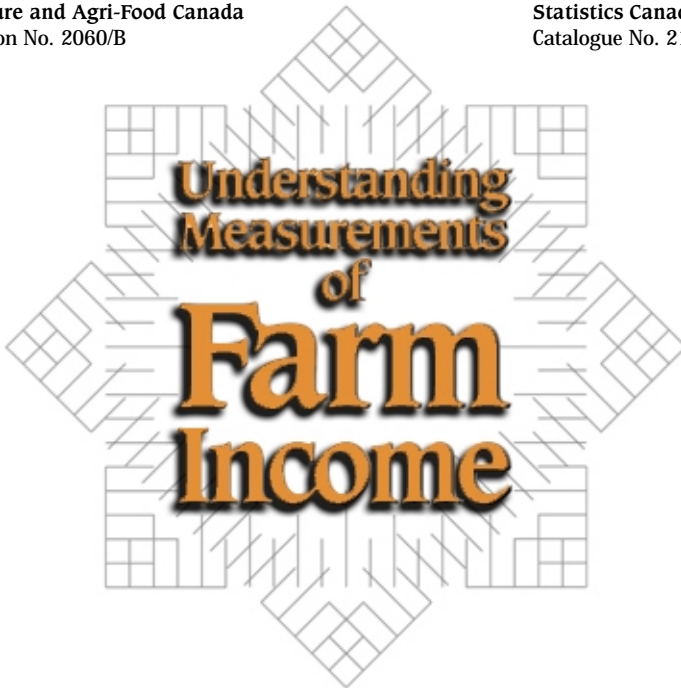
Understanding
Measurements
of
**Farm
Income**

Canada



Agriculture and Agri-Food Canada
and Statistics Canada

Agriculture et Agroalimentaire Canada
et Statistique Canada



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Note of appreciation

Canada owes the success of its statistical system to a long-standing cooperation between Statistics Canada, the citizens of Canada, its businesses and governments. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.

Introduction

Statistics Canada publishes several measures of farm income, each produced for a different purpose and Agriculture and Agri-Food Canada generates an aggregate farm income forecast. This bulletin, prepared jointly by the two organizations, describes the concepts behind these different measures, the methods by which the measures are constructed, and the uses for which they were designed.

The highest-profile series of measures of net farm income are produced in the Farm Income and Prices Section of Statistics Canada's Agriculture Division as part of the agriculture economic statistics program. These annual series measure the aggregate earnings of farmers from the production of agricultural goods in each province. *Section 1* of this bulletin deals with these measures as well as Agriculture and Agri-Food Canada's forecast.

Farm tax records and the Farm Financial Survey are another source of farm income information. Processed in the Whole Farm Data Projects Section of Statistics Canada's Agriculture Division, these data typically present frequency distributions and averages of farm income variables by type of farm and sales class. *Section 2* describes the income data from tax sources.

Monthly, quarterly and annual estimates of national farm income and production are published by the System of National Accounts Branch of Statistics Canada and are described in *Section 3*. Farm income contributes to the economic production and wealth of Canada, although the concepts and definitions surrounding the Canadian System of National Accounts require modifications to the Agriculture Division's farm cash receipts and expenses series before inclusion.

Finally, the Census of Agriculture Section of Statistics Canada's Agriculture Division keeps track of the total sales and expenses of all census farms, as reported every five years in the Census of Agriculture. Since the net farm self-employment income of farm operators is available from the Census of Population through a linkage of the two censuses, these variables are used in cross-sectional and socio-economic analysis of farms and operators. Details can be found in *Section 4*.

Section 1

Agriculture Economic Statistics Program Measures



Measures of net farm income

The agriculture economic statistics program uses three aggregate measures of net farm income (see diagram):

- **Net cash income** measures farm business cash flow (gross revenue minus operating expenses) generated from the production of agricultural goods. Net cash income represents the amount of money available for debt repayment, investment or withdrawal by the owner.
- **Realized net income** measures the financial flows, both monetary (cash income) and non-monetary (depreciation and income-in-kind), of farm businesses. Similar to net cash income, realized net income represents the net farm income from transactions in a given year regardless of the year the agricultural goods were produced.
- **Total net income** measures the financial flows and stock changes of farm businesses. Total net income values agriculture economic production during the year that the agricultural goods were produced. It represents the return to owner's equity, unpaid labour, management and risk.

Components of these net farm income measures

- 1 - Farm cash receipts** include revenues from the sale of agricultural commodities, program payments from government agencies, and payments from private crop and livestock insurance programs. Receipts are recorded in the calendar year (Jan.-Dec.) when the money is paid (cash basis) to farmers.

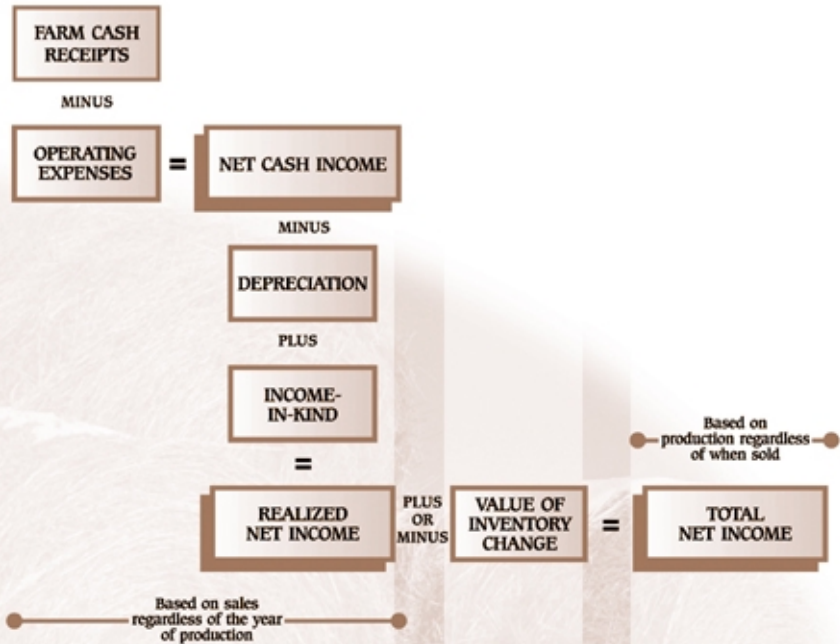
Market receipts are farm cash receipts minus program payments. They include sales of field crops, fruits, vegetables, floriculture and nursery products, maple and forest products, livestock, milk, poultry, eggs, wool, fur and honey. The information is collected from a wide variety of surveys and administrative sources that report the quantity and average farm price for each commodity marketed in a province.

Program payments are tied to agricultural production and paid directly from government to farmers. Examples of these payments include the Net Income Stabilization Account (NISA), non-private crop insurance payments, and provincial stabilization programs. NISA payments include only the withdrawals from the government portion of the NISA accounts because the producer account includes only money previously counted as farmer income.

- 2 - Farm operating expenses** represent business costs incurred by farm businesses for goods and services used in the production of agricultural commodities. Expenses, which are recorded when the money is disbursed by the farmer, include property taxes, custom work, rent, fertilizer and lime, pesticides, machinery and building repairs, fuel for heating and machines, wages, interest and business share of insurance premiums.

Initial expense estimates (released in May following the reference year) are based mainly on analysts' estimates using price changes from the Farm Input Price Index (FIPI) and quantity changes based on discussions with industry contacts and other available data. The first revisions in November are based on preliminary tax data. The following May, final tax data are used.

Different Measures of Farm Income



- 3 - Income-in-kind** measures the value of the agricultural goods produced on farms and consumed by farm operator families. It is included to measure total farm production. There is no monetary disbursement related to income-in-kind. It is calculated using Statistics Canada estimates of per capita food consumption, coupled with Census measurements of the farm population and the average prices that producers would have received in the marketplace.
- 4 - Depreciation** charges account for the economic depreciation or for the loss in fair market value of the capital assets of the farm business. There is no monetary disbursement associated with depreciation. Calculated on farm buildings, farm machinery, and the farm business share of autos, trucks and the farm home, depreciation is generally considered to be the result of aging, wear and tear, and obsolescence. It represents a decrease in the potential economic benefits that can be generated by the capital asset.

5 - Value of inventory change (VIC) measures the dollar value of the physical change in producer-owned inventories. This concept is used to value total agricultural economic production. To calculate VIC, the change in producer-owned inventories (between the end and the beginning of a calendar year) is first derived and then multiplied by the average annual crop prices or value per animal. This calculation is different from the financial or accounting book value approach, which values the beginning and ending stocks, and then derives the change.

The VIC over all the major commodities can vary widely (depending on the size of the change of inventories and prices). The VIC can be either positive (when inventories are larger at the end of the year compared to the beginning levels) or negative (when year-end inventories are smaller than the levels at the beginning of the year). If the inventory levels are the same at the beginning and end of the year, VIC will be zero despite price changes.

Not included in net farm income

The net farm income measures do not include the following:

- income that farm operators or their families may receive from other sources (e.g., wages and salaries, and investment income);
- income earned from non-agricultural use of the farm;
- revenue or expenses from the sale or purchase of farm capital (real estate, machinery and equipment), although the interest on these purchases is included;
- farm-to-farm transactions, unless they occur across a provincial or national border (within a province, sales from one farm are an expense to another, thus offsetting each other);
- indirect program payments, such as research and industry development funds, where funds are directed to a third party; and
- capital payments where funds do not relate to current production and transfer payments (such as training allowances) directed to individuals.

Production of the farm income forecast

Net farm income is of interest to the press, farmers and their organizations, governments, financial institutions, industry and the public. The numbers are used to assess the state of the agricultural industry and form the basis of various policy options.

Statistics Canada publishes estimates of net farm income twice a year: in May and November following the reference year. Estimates are Statistics Canada's interpretation of history and are based on survey and administrative data.

Agriculture and Agri-Food Canada (AAFC), in conjunction with the provincial government representatives and with the assistance of Statistics Canada, prepares a forecast of net farm income for current and future years twice a year and publishes it generally two months following the Statistics Canada release of farm income. Statistics Canada's published estimates provide the base for the forecast.

For the first two years, the AAFC forecast is based primarily on input from commodity analysts, provincial representatives and Statistics Canada officials.

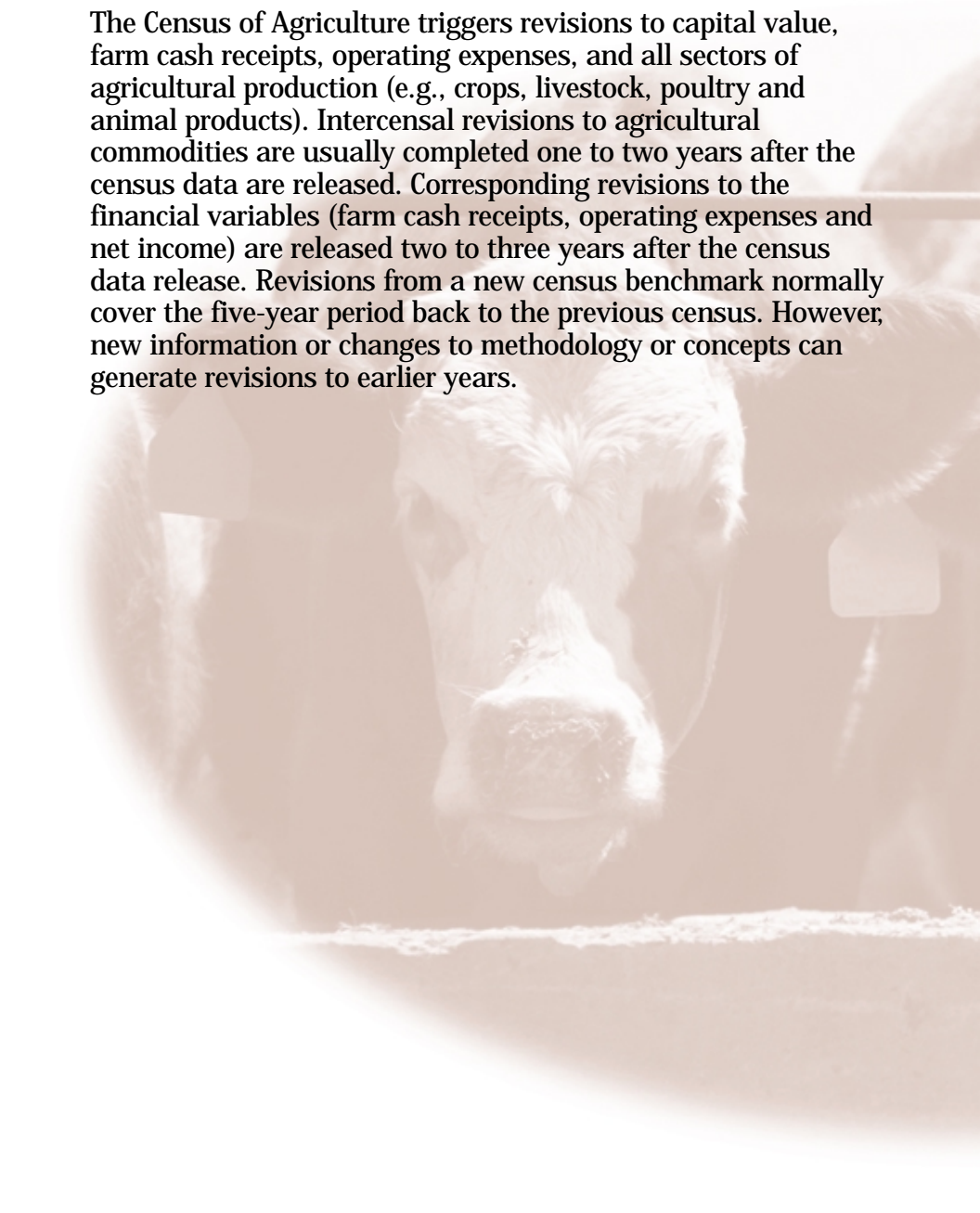
For the last three years, forecasts rely more on quantity and price assumptions from the Medium Term Policy Baseline model. Commodity analysts also provide advice. The MTPB relies heavily on inputs from the World Agricultural Outlook of the Food and Agricultural Policy Research Institute (FAPRI), the Agricultural Baseline Projections of the United States Department of Agriculture (USDA), and Canadian macro-economic projections provided by the Conference Board of Canada. The MTPB is described as a plausible view of the future and not a prediction of future events.

The farm income forecast and the MTPB are released by AAFC on its website. The farm income forecast is also published in the "Farm Income, Financial Conditions and Government Assistance Data Book".

Revision of farm income measures

Estimates can change for a number of reasons, such as better quality data becoming available or improved methods. The Statistics Canada May and November releases incorporate revisions of farm cash receipts, farm operating expenses, and production and inventory levels.

The Census of Agriculture triggers revisions to capital value, farm cash receipts, operating expenses, and all sectors of agricultural production (e.g., crops, livestock, poultry and animal products). Intercensal revisions to agricultural commodities are usually completed one to two years after the census data are released. Corresponding revisions to the financial variables (farm cash receipts, operating expenses and net income) are released two to three years after the census data release. Revisions from a new census benchmark normally cover the five-year period back to the previous census. However, new information or changes to methodology or concepts can generate revisions to earlier years.



Small changes create a big impact

All measures of net farm income are relatively small compared to cash receipts and expenses. Consequently, a relatively small change in either farm cash receipts or expenses can produce a relatively large change in net income. This is important to remember when assessing the impact of revisions or forecasts.

In the following example, a 1% change in receipts and expenses results in a 5% change in net cash income, a 12% change in realized net income, and an 11% change in total net income.

Table 1: Example of Impact of Cash Receipts Revision on Income Measures

Item	Estimate	Revised estimate	Revision
	million \$	million \$	%
Cash receipts	30,000	30,300	+ 1.0
- Expenses	24,000	24,000	
= Net cash income	6,000	6,300	+ 5.0
+ Income-in-kind	155	155	
- Depreciation	3,700	3,700	
= Realized net income	2,455	2,755	+ 12.2
Value of inventory change (VIC)	+ 200	+ 200	
= Total net income	2,655	2,955	+ 11.3

Section 2

Tax Data and Farm Financial Survey



Tax Data

The taxation data program uses samples of both incorporated and unincorporated farm tax filer records to estimate a range of financial variables, including detailed revenue and expenses, additions and disposals of assets, and off-farm income of operators and their families. In the unincorporated sector, the sampling rates vary from 100% in Newfoundland to 40% in Ontario. The incorporated sector includes incorporated farms with sales over \$25,000 per year, at least 51% of which come from agricultural activities. The series is annual with initial preliminary results released in November of the year after the reference year.

Many of the concepts and data sources of the net farm income accounts differ from the taxation data program. An excellent example is depreciation. In the taxation data program, this is referred to as capital cost allowance, and represents the expense written off by the tax filer as allowed by tax regulations. The farmer may deduct any amount up to the maximum allowable. In the net farm income accounts, depreciation represents the economic 'wear and tear' expense, which can be very different from the amount farmers are allowed and decide to declare for tax purposes. Some of the main differences between the taxation data program and the numbers found in the net farm income accounts are coverage and conceptual differences, such as the treatment of farm-to-farm sales and accrual reporting. The main advantage of the taxation data program is its capacity to produce revenue and expense statistics by farm type, sales classes and sub-provincial regions.

Farm Financial Survey

The biennial Farm Financial Survey is another source of farm income information that conceptually resembles the estimates from the tax data. This survey collects gross receipts broken into direct program payments, sales of grains, sales of horticultural products, sales of cattle, sales of pigs, sales of poultry, sales of dairy products and other farm revenue as well as total expenses (excluding depreciation) along with detail on interest expenses, wages, crop insurance and NISA contributions. The sample includes about 18,000 farms, both incorporated and unincorporated, and with annual sales exceeding \$10,000.

The results are released every second year in December. The published estimates include primarily balance sheet items including the details of income and expenses at the province level by sales class and farm type and usually in the form of averages.

The Farm Financial Survey is sponsored by Agriculture and Agri-Food Canada who is the main user of the data.



Section 3

System of National Accounts



The national accounts are the principal tools used in macro-economic analysis to assess the performance of the economy. Agriculture's contribution to the economy is measured separately in three areas within the national accounts. Virtually all of the data entered into the agricultural components of the national accounts are sourced from the Farm Income and Prices Section of the Agriculture Division. The data are adjusted to comply with national accounts concepts.

Income and expenditure accounts

These accounts present value of gross domestic product measured in current dollars at market prices. Preliminary quarterly estimates are released 60 days after the reference quarter at the national level. Preliminary estimates at the provincial level are released annually in October following the end of the reference year. The agriculture contribution, termed 'accrued net farm income of farm operators from farm production,' is calculated as the total net farm income (from the Agriculture Division farm income accounts) minus the profits of incorporated farms (which are included elsewhere in the accounts). Adjustments are also made to record the operations of the Canadian Wheat Board and program payments and to accrue or link them to the year of production rather than the year the income was received. VIC is calculated on a quarterly instead of an annual basis. This normally produces different results from annual VIC since average quarterly prices are used instead of average annual prices. VIC has its own line on the expenditure side of the income and expenditure accounts.

Gross domestic product by industry

These seasonally adjusted monthly estimates of the national value of gross domestic product by industry, expressed in constant dollars at factor cost, are released about 60 days after the end of the reference month. An annual series by province is released in the second quarter after the end of the reference year. Agriculture appears in the monthly series as an industry with three components: crop production, livestock production and services incidental to agriculture such as veterinary services. In the annual series, crops and livestock are combined. These numbers are mainly constructed from parts of the Agriculture Division net farm income accounts. This measure of the industry differs from the income and expenditure accounts because it includes incorporated activity as well as related services.

Input–output accounts

These accounts measure the contribution of each industry to gross domestic product by means of a table showing the structural detail by industry (both inputs and outputs), and balanced commodity flows. These accounts provide an annual benchmark for gross domestic product and a means of auditing source data for consistency and compatibility. Agriculture Division breaks down its farm income series into crops and livestock sectors. Input–output accounts are produced annually and released three years after the end of the reference year.



Section 4

Census of Agriculture



Every five years, the Census of Agriculture provides a complete enumeration of all farm operations in Canada. The definition of a census farm as ‘an operation producing agricultural products with the intent to sell them’ is all-inclusive. There is no minimum sales requirement. Data are collected on a wide range of farm and farm operator variables, including gross farm receipts and farm operating expenses. Census of Agriculture results are published about 17 months after the end of the reference year.

As part of the census program, the list of farm operators in the Census of Agriculture is linked to the Census of Population. This permits the full set of Census of Population income variables to be tabulated for farm operators and their families. One such variable, ‘net farm self-employment income,’ includes farm-to-farm sales. The usefulness of this linkage derives from the ability to cross-classify income with other farm or farm operator variables from both the agriculture and the population censuses. The income variables are collected on the long form of the Census of Population questionnaire (completed by every fifth respondent), necessitating a weighting process in order to create estimates. The linked file of the censuses of Population and Agriculture is released two and a half years after the reference year.

Conclusion

There is seldom a discussion or debate in the agriculture community where one or another of the measurements of farm income is not tossed into the process. The participants in such discussions represent the full spectrum of interests from academics, governments and industry to farm organizations and the media. Whether for analysis, debate or policy-making, the need for a variety of accurate, focussed and timely estimates of farm income is well established.

