

# BC dairy, egg and poultry industries

Economic impact of British Columbia's dairy, chicken, turkey, hatching egg and table egg industries – 2011 update

*April 2013*









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# 1 *Executive summary*

In this report, we have examined the economic impacts of British Columbia's supply managed commodity industries and its associated value chain for 2011. Commodities include the dairy, chicken, turkey, hatching egg, and table egg commodities. Together supply managed industries are referred to as the BC Dairy, Egg, and Poultry Industries (BCDEPI). This report builds upon the results determined in an earlier study that measured the socio-economic benefits of the industries for 2007, *Socio-economic impact of British Columbia's Dairy, Chicken, Turkey, Hatching Egg and Table Egg industries*, and a subsequent study that provided an update of the economic impacts of the industry value chain for 2009, *Economic impact of British Columbia's Dairy, Chicken, Turkey, Hatching Egg and Table Egg industries, 2009 results*.



## Economic impact of the BCDEPI value chain

The BCDEPI value chain includes the flow of products from the farm gate to processing and further processing activities. The BCDEPI value chain impacts the BC economy through direct expenditures on goods and services, the employment of workers and the generation of tax revenues for local, provincial and federal governments. These impacts are presented in Table E.1.

Total value added generated by the BCDEPI value chain in British Columbia is estimated to be \$1.6 billion. It is estimated that the BCDEPI value chain generates employment of 31,726 with associated salaries and wages of \$917.8 million, a 3% reduction from 2009.

A comparison of the change in economic impacts over the five-year period from 2007 to 2011 indicates the overall industry is fairly stable although increasing in value.

## Highlights from the economic analysis

BCDEPI is a significant contributor to provincial GDP. Economic output supported by the BCDEPI value chain is estimated to be \$1.6 billion in nominal GDP. Provincial nominal GDP in 2011 was equal to approximately \$196 billion therefore, the estimated magnitude of the supply managed sector's GDP impact remains unchanged from 2009 and amounted to approximately 0.8% of the BC economy.

BCDEPI is a significant contributor to provincial employment. Economic activity generated by the BCDEPI value chain is estimated to support 31,726 jobs. With approximately 2.3 million people employed in BC at the end of 2011, the estimated employment impacts have increased slightly representing approximately 1.4% of total BC employment. Employment in the BCDEPI value chain was slightly larger than the mining, quarrying and oil and gas extraction industry at 24,700 employed.

BCDEPI is a relatively stable industry. Although contributions to GDP from the BCDEPI value chain may not be as large as other sectors, in contrast, BCDEPI experiences less volatility in response to changing market conditions. Similarly,

members of the BCDEPI value chain experience a relatively stable employment base year after year in contrast to the forestry and logging sector. In 2010, forestry employment was 16,100 and declined in 2011 to 14,000 in response to volatility in global markets.

Producer price increases are less than inflation as producer prices received by farmers have increased less than the consumer price index. In British Columbia, CPI has increased on average 3.3% per year since 1980 while supply management producers have received increases ranging on average from 1.9% to 2.4% per year.

Total output generated by BCDEPI in the BC economy has increased steadily. Total output directly generated by the BCDEPI value chain is estimated to equal \$2.5 billion, a 4.2% increase from 2009. Direct output supports a further estimated \$2.8 billion in indirect output in the BC economy (a 7.7% increase from 2009) and stimulates an additional \$272.7 million in induced economic impacts (a 4.2% increase from 2009). Total output generated or supported by BCDEPI in the BC economy is therefore estimated at \$5.6 billion representing a 5.7% increase from \$5.3 billion in 2009.

**Table E.1: BCDEPI Economic Impacts Summary Table, 2011 (\$'000)**

Impact	Direct	Indirect	Induced	Total
Output	2,479,403	2,802,310	272,734	5,554,447
GDP (value-added)	552,582	922,911	148,764	1,624,257
Wages & salaries	341,828	495,298	80,686	917,812
Taxes	94,217	76,861	52,067	223,145
Employment (FTE)	6,944	22,427	2,355	31,726

**Table E.2: BCDEPI Total Economic Impacts Summary Table, % change from 2007 – 2011 (\$'000)**

Impact	2007	2009	2011	% change
Output	5,000,792	5,257,755	5,554,447	11.1%
GDP (value-added)	1,561,638	1,566,964	1,624,257	4.0%
Wages & Salaries	893,720	949,509	917,811*	2.7%
Taxes	205,983	211,856	223,146	8.3%
Employment (FTE)	28,375	26,843	31,726	11.8%

\* The decrease in wages and salaries from 2009 to 2011 is attributable to an adjustment in the methodology used to estimate egg processing revenues.

## 2 *Background and study purpose*

In Canada, the dairy, chicken, turkey, hatching egg and table egg industries operate under national supply management systems. These systems are administered by national bodies and by provincial commodity marketing boards that have been delegated powers by federal and provincial governments. Under the Canadian supply management systems, the overarching goal is to match total supply of a commodity available with its market demand, thereby providing Canadians with an adequate supply of the commodity at a reasonable price while providing Canadian producers a fair return on their operations.



In British Columbia, the five supply-managed industries (dairy, table egg, hatching egg, chicken and turkey industries) have formed a substantial part of the economic and social fabric for well over one hundred years, contributing to local communities throughout the province. The purpose of the present study is to provide an update to the province-wide economic impacts and benefits produced by the industries as they stood in 2011 (the most recent year for which full data are available), PricewaterhouseCoopers (PwC) released two previous reports on the economic and socio-economic value of BC's supply managed industries to the provincial economy, the *Socio-economic impact of British Columbia's Dairy, chicken, Turkey, Hatching Egg and Table Egg industries, 2007* and the *Economic Impact of British Columbia's Dairy, Chicken, Turkey, Hatching Egg and Table Egg Industries – 2009*. This study updates the economic values provided in the 2009 report.

## Background and study purpose

BC Dairy, Egg and Poultry Industries (BCDEPI) is a partnership formed on behalf of British Columbia's five supply-managed industries: the dairy, chicken, turkey, hatching egg and table egg industries. BCDEPI identified the need to undertake an updated assessment of the economic contributions of British Columbia's supply management sector and engaged PricewaterhouseCoopers LLP (PwC) to conduct the study.

The scope of the study included updating industry profiles and reporting on the economic impacts and benefits of the supply managed industries to the provincial economy.

**Industry profiles** – A description of each of the industry characteristics, including: volume and farm receipts, number of producers, employment and wages, investment and purchases, and industry value chain.

### **Economic impacts and benefits –**

Analysis of the economic impacts and benefits produced by the industries, and calculation of the economic impacts for three commodity value chains: dairy, poultry and table eggs. For purposes of the economic impact calculations, each value chain includes farm production, processing and further processing. The calculation of the value chain for the five industries on an aggregated basis was also carried out, that included the spending, value-added, employment, wages and salaries, and taxes produced in total by the five industries.

## Data collection, availability, and reliability

For this study, we have used 2011 as our base year for measuring the economic impacts of the various industries as all required data for that year have been reported.

Data required to prepare the industry profiles and economic impact modeling were generally available. Industry statistics were mainly sourced from Statistics Canada and the provincial and federal supply management marketing boards. Other industry data collected for the value chain analysis was obtained directly from the companies involved.

Additional material was collected through a review of publically available reports. The list of industry multipliers and data sources used for the study is presented as Appendix A and B respectively.



## 2 Background and Study Purpose

### Economic impact methodology

This study uses input-output accounts to predict how an increase in demand for the products of one industry will impact other industries and therefore on the entire economy. The BC Input-Output accounts reflect the underlying industrial structure of the entire BC economy in terms of who makes what and who uses what. In principle, the model contains the recipes for every output of the economy.

Economic impacts are generally categorized at the direct, indirect, and induced levels. Direct impacts are changes that occur in “front-end” businesses that would initially receive expenditures and operating revenue as a direct consequence of the operations and activities of a facility. Indirect impacts arise from changes in activity for suppliers of the “front-end” businesses. Induced impacts arise from shifts in spending on goods and services as a consequence of changes to the payroll of the directly and indirectly affected businesses.

Estimating direct, indirect and induced economic impacts is generally done through the use of Input-Output multipliers. Each of these quantities is described below.

**Output** is the total gross value of goods and services produced by a given company or industry measured by the price paid to the producer (versus the price paid by the consumer, which can include transportation and retail mark-ups). This is the broadest measure of economic activity.

**Gross Domestic Product (GDP)**, or value-added refers to the additional value of a good or service over the cost of inputs used to produce it from the previous stage of production. Thus GDP is equal to net output, or the difference between revenues and expenses on intermediate inputs. It is the incremental value created through labour or mechanical processing.

**Employment** is measured in terms of full-time equivalents (FTEs).

**Wages and Salaries** is a measure of earnings by FTEs and represents the direct wages and salaries earned, as well as employee benefits and self employed income.

**Government Revenues** arise from personal income taxes, indirect taxes less subsidies (e.g. sales tax), and corporate income taxes.

### Estimating the impact of the value chain

It is important to note that this study is estimating economic impacts across an industry value chain. Therefore, the supply management industries are themselves interrelated as the output or production of some industries represents an input for other industries. For example, broiler hatching eggs represent an input into hatchery production, which is in turn an input into chicken production, which is in turn an input into poultry processing. This creates a complication in measuring economic impacts because the direct impact of one industry is implicitly included in the indirect or multiplier effects of an industry to which it is a supplier.

We have therefore carefully traced impacts throughout the value chain to ensure there has been no double counting of estimated economic impacts. The economic impact estimates for each of the BCDEPI commodities is presented in Appendix D.

### Organization of the report

The remaining sections of the report are organized as follows.

Section 3 provides a profile of each of the supply management industries, together with a description of the economic impacts and benefits they produce.

Section 4 provides the summary results of the industry profiles and the aggregate results for the economic impact of the supply management value chain and other economic benefits.

### Report limitations

PwC has relied upon the completeness, accuracy and fair presentation of all the information, data, advice, opinion or representations obtained from public sources and the Client (collectively, the “Information”). The findings in the Report are conditional upon such completeness, accuracy and fair presentation of the Information. PwC has not verified independently the completeness, accuracy and fair presentation of the Information.

PwC reserves the right, at its discretion to withdraw or make revisions to the Report should PwC be made aware of facts existing at the date of the report which were not known to PwC when it prepared the Report. The conclusions and recommendations are given as of the date hereof and PwC is under no obligation to advise any person of any change or matter brought to its attention after such date, which would affect the findings and conclusions and PwC reserves the right to change or withdraw the Report.

PwC understands this report will be provided to the dairy, egg and poultry industries, government representatives, the general public and made available on the respective industry association websites. We do not accept responsibility for any losses arising from unauthorized or improper use of this Report.



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## ***BC DEPI – Industry profiles***



## 3.1 British Columbia dairy industry



In 2011, there were **517 dairy farms** in British Columbia producing about 666 million litres of milk and generating \$522 million in farm cash receipts.

### BC's supply management in the dairy industry

Supply management in the dairy industry is achieved by balancing milk production from provincial farms with local consumption of dairy products. Each province is responsible for the production of fluid milk, setting quota policies, pricing formulas, and other regulations, while the federal government has jurisdiction over the industrial milk market. Each province allocates its respective share of the Market Share Quota (MSQ) to its producers according to its own policies. British Columbia's raw milk production is sold as part of the Western Milk Pool with Alberta, Saskatchewan, and Manitoba. The price received by producer's for fluid milk is based on the calculation of two components: consumer price index (50%), and the average cost of production (50%). The price received by producer's for industrial milk is based on the support prices announced by the Canadian Dairy Commission, relying in part on the average cost of production.

In British Columbia, there have been three organizations responsible for the production, delivery, and marketing of milk under the supply management system. The BC Milk Marketing Board (BCMMB) is the regulatory agency responsible for regulating the province's milk production and marketing. BCMMB has the authority to promote, control, and regulate the province's milk production and marketing by allocating milk quotas to producers, administering the provincial share of the national industrial quota, and licensing all producers and processors of milk, fluid milk and manufactured milk products within British Columbia.

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Approximately \$2.7 billion is generated by the dairy industry value chain in economic output contributing an estimated **\$781.7 million** to GDP.

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Recently, the BC Dairy Foundation (BCDF) and BC Milk Producers Association (BCMPA) merged into one, not-for-profit organization, the BC Dairy Association, effective December 1, 2011. The change in organization structure is intended to increase efficiency of both organizations as both are supported by all dairy producers within the province. The newly formed organization continues as member and financial supporter of the Dairy Farmers of Canada (DFC).

The newly formed BC Dairy Association will continue delivering the programs previously conducted by the BC Dairy Foundation and the BC Milk Producers Association. These include the following program areas:

**BC Milk Producers Association:** policy development, crisis management, animal welfare, advocacy, environmental issues, trade policy and communications with industry members and affiliates.

**BC Dairy Foundation:** developing and executing fluid milk marketing initiatives and promotion programs, delivering nutrition education programs to schools and the public, administering the school milk program, organizing public events and dairy programs at fairs and dealing with all dairy related public relations and media.



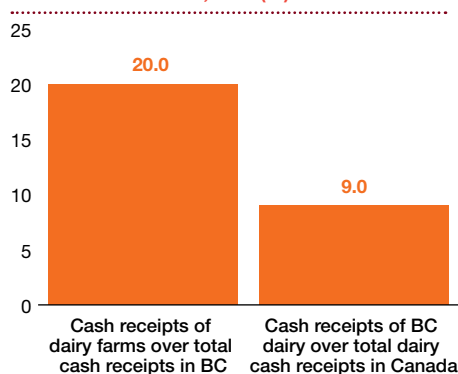
## Volume and farm receipts / revenues

In 2011, British Columbia dairy farms produced 666 million litres of milk valued at \$522 million.<sup>1</sup> BC dairy production expanded 12% from 2002 to 2011 despite a 27% decline in the number of farms producing milk. Moreover, average milk production per farm in British Columbia increased from 869 thousand litres of milk in 2002 to 1,317 thousand litres of milk in 2011. This increase in absolute and average production suggests that BC dairy farms have become both larger and more efficient.

In 2011, the production value of BC dairy farms represented 9% of Canadian milk production, behind Ontario and Quebec. Ontario and Quebec have historically had a disproportionate share of industrial milk quota (MSQ) which is why the BC milk production share of Canadian production is less than the share of the population. Dairy production is BC's top agriculture industry accounting for 20% of all farm cash receipts in the province (Figure 1).

Dairy producers in British Columbia supply two main markets, fluid milk and industrial dairy products. The fluid milk market represents approximately 53% of milk production, while the remaining 47% is manufactured into dairy products. Between 2002 and 2011, dairy production (in litres) in British Columbia grew 3% per year, while total farm cash receipts grew 6% per year (Figure 2).

**Figure 1 Relative size of the dairy industry in BC and Canada, 2011 (%)**



1. Sales at farm gate

2. Per capita disappearance is a proxy for per capita consumption as data for the interprovincial movements of final products is not available to make a definitive per capita consumption calculation.

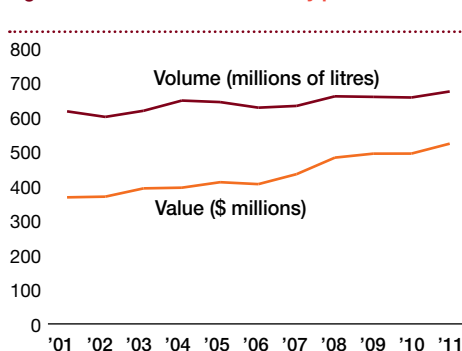


Dairy producers account for about **20%** of total farm cash receipts in British Columbia.

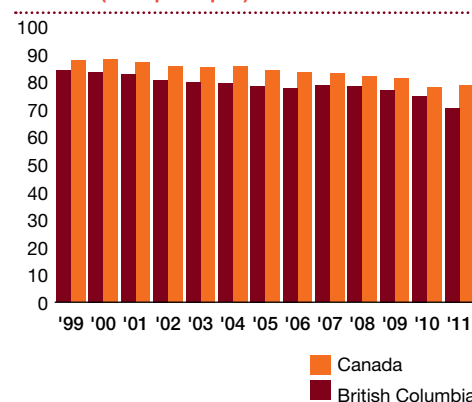
Although milk production in British Columbia has increased slightly, the per capita disappearance of fluid milk has decreased at a faster rate compared to the national average (Figure 3). This is likely due to two factors. Packaged milk products move from province to province and more flow into BC than flow out of BC. In addition, demographics influence milk consumption. The rapidly aging population of BC has an effect on fluid milk consumption as does the changing ethnic makeup of the province. In 2011, British Columbia per capita disappearance of fluid milk was 70.4 litres, a 12.7% decline since 2002 when per capita disappearance was 80.6 litres. Nationally, the rate of decline in consumption between 2002 and 2011 slowed to 8.1%.

Milk consumption by consumers and milk used in industrial products directly affects the amount of milk BC dairy farmers produce each year. BC dairy producers adjust milk production volumes by producing enough fluid milk to satisfy demand. The differences that exist between the volume produced and final consumption can be explained by interprovincial trade, retail and merchandising strategies and the changing composition of the processing and retail companies.

**Figure 2 Volume and value of dairy production in BC**



**Figure 3 Per capita disappearance of fluid milk<sup>2</sup> (litres per capita)**



An estimated **7,834 jobs** are supported directly by dairy producers (5,653) and processors (2,181), with a further 7,717 in related industries.

The demand for dairy products is influenced by consumer preferences and prices. Figure 4 illustrates the price received by dairy producers for milk production has increased 2.4% per year, while inflation over the same period increased 3.3% per year.<sup>3</sup> This implies that BC farmer's incomes related to milk production has not increased as fast as the province's cost of living. This also suggests that food price increases have mostly occurred further along the value chain, during processing, distribution and at retail.

#### Employment and wages

In 2011, the dairy industry employed about 5,653 people and was responsible for an estimated \$88.9 million in wages and salaries. Dairy farmers employ approximately 21.5% of BC's agricultural jobs.

#### Investment and purchases

Investment in machinery and equipment (M&E) is important as it can help to improve farm efficiency.<sup>4</sup> The average dairy farmer spent about 6% of operational revenue on machinery expenses (Figure 5).

According to Statistics Canada, in 2011 BC dairy producers spent about \$55.7 million on milk cows and other primary inputs, \$228.7 million on feed, supplement, straw, and bedding, \$28.3 million on veterinary and breeding fees, and \$54.9 million on machinery expenses<sup>5</sup>.

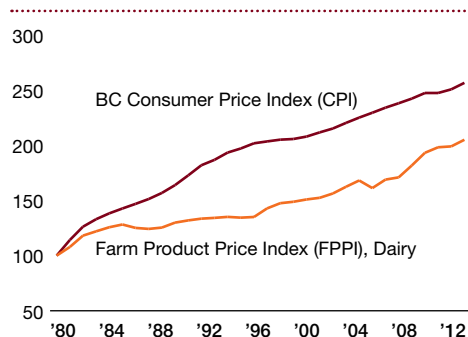
#### Economic impacts of the BC dairy industry value chain

The dairy industry value chain methodology follows the distinct stages of production in the material flow from production of raw milk on the farm to delivery to the final consumer. In this

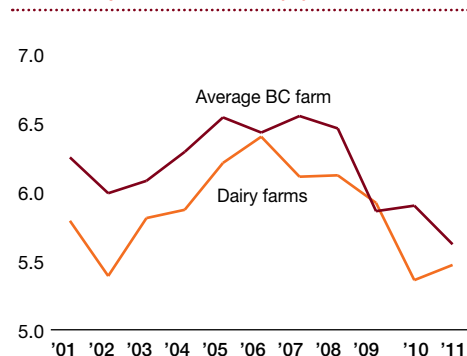
section we present the economic impact of the dairy value chain. Figure 6 illustrates the dairy industry value chain.

The value chain for the dairy industry is extensive and complicated going beyond milk producers and processing plants. Dairy farmers use the products and services from the machinery and equipment, animal medicine, and feed industries, while the transportation and packaging industries are also important for the processing and further processing plants. Dairy processing and further processing plants are located in the Fraser Valley, Okanagan and Vancouver Island. Because of transportation costs and distance to ship raw milk from northern BC to a BC processor, some raw milk from the Peace River area is processed in Alberta. Three major dairy processors account for over 90% of the raw milk processed in the province.

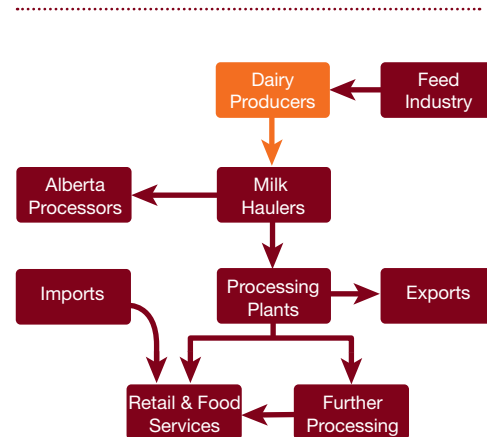
**Figure 4 BC consumer price index (CPI) and farm product price index (FPPI) for dairy, 1980=100**



**Figure 5 Machinery expenses over operational revenue (%)**



**Figure 6 Dairy industry value chain**

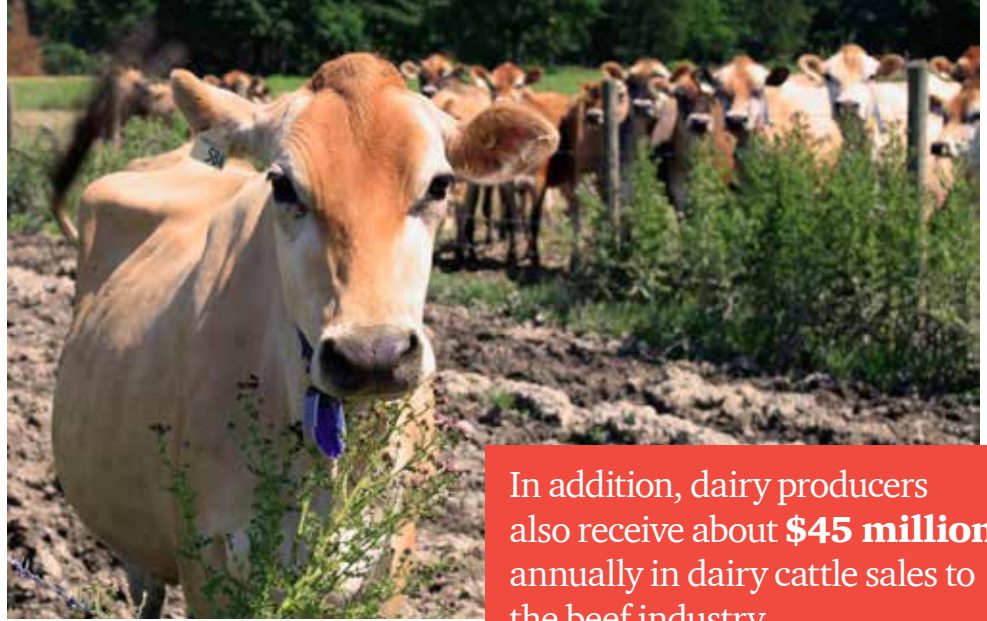


3. Measured through CPI, which is the rate of price change for goods and services.

4. Labour productivity is defined as real gross domestic product (GDP) per hour worked.

5. Machinery expenses include small tool expenses, net fuel expenses, machinery, truck, auto, repair, license, and insurance.





In addition, dairy producers also receive about **\$45 million** annually in dairy cattle sales to the beef industry.

## Economic impact of the value chain for the dairy industry

In this section we present the economic impact of the dairy value chain from the producers to the processors. (Wholesale and retail activities are excluded from this analysis).

The impacts summarized in this section reflect the entire value chain for each segment but it is important to note that because BCDEPI products are inputs into the final manufacturing process, their activity results in indirect, or downstream, impacts of final demand or output. To provide an understanding of how these downstream impacts are accounted for in our estimates, we have provided a detailed illustration of economic impacts, by value chain segment in Appendix C. Detailed economic impacts for each BCDEPI commodity is provided as Appendix D.

## BC dairy value chain

The economic impact of the BC dairy industry is summarized in the table below. Overall, the BC dairy industry is contributing 49% of estimated BCDEPI aggregate output; 48% of estimated BCDEPI generated GDP; 49% of employment; 43% of salaries and 46% of tax revenue.

In total, the BC dairy industry generates approximately \$2.7 billion in economic output, of which close to \$781.7 million can be considered new, or value-added to the economy. The GDP total includes \$233.6 million from dairy processing, \$132.1 million from dairy producers, and \$348.3 million from other related economic activity.

Approximately 7,834 jobs are supported directly by dairy producers (5,653) and processors (2,181), with a further 7,717 in related industries.

Finally, approximately \$101.6 million in municipal, provincial, and federal taxes are generated directly and indirectly by the dairy industry.

About **\$101.6 million** in municipal, provincial and federal taxes are generated directly and indirectly by the dairy industry value chain.

**Table 1 Economic impact of the BC dairy industry value chain, 2011 (\$'000s)**

Impact	Direct	Indirect	Induced	Total
Output	1,128,940	1,448,679	124,183	2,701,802
GDP (value-added)	233,561	480,391	67,736	781,688
Wages & Salaries	117,772	243,906	34,391	396,069
Taxes	42,900	34,997	23,708	101,605
Employment (FTE)	2,181	12,298	1,072	15,551

Dairy producers directly generated approximately \$132.1 million towards provincial GDP employing an estimated **5,653 workers** representing 21.5% of BC agriculture jobs.

## 3.2 British Columbia chicken industry

### Supply management in the chicken industry

The British Columbia Chicken Marketing Board, (BCCMB) was created in 1961 with the mandate to monitor and regulate the production and marketing of chicken in British Columbia. Included are all activities from the time the chick hatches until the chicken is purchased at the retail level. The BCCMB also negotiates the producer selling price of chicken with processors.

Chicken quota in Canada is shared by each province from a quota allocation that is set periodically every 8 weeks. Each province commits to produce a quantity corresponding to its periodic quota allocation without it being exceeded. In British Columbia, the BCCMB controls the supply of chicken to match the estimated demand in the province, given a calculated price paid to producers.

In 2011, there were **331 chicken farms** in British Columbia producing about 154 million kilograms of meat and generating \$351 million in farm cash receipts.



Chicken producers contribute an estimated **\$37.9 million** to total municipal, provincial, and federal taxes.



Including chicken and turkey producers, processors and allied industries, the BC poultry industry value chain generates approximately \$2.4 billion in economic output contributing \$712.4 million in GDP to BC's economy.

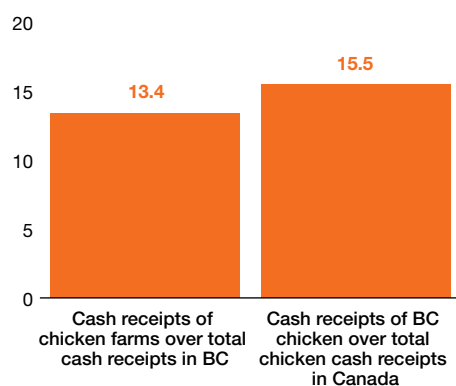
## Volume and revenues

In 2011, British Columbia chicken farmers produced 154.0 million kilograms of chicken valued at \$351.1 million. Chicken production is one of BC's top three agriculture industries, representing 13.4% of total farm cash receipts. The BC chicken industry accounts for about 15.5% of all Canadian chicken farm cash receipts (Figure 7).

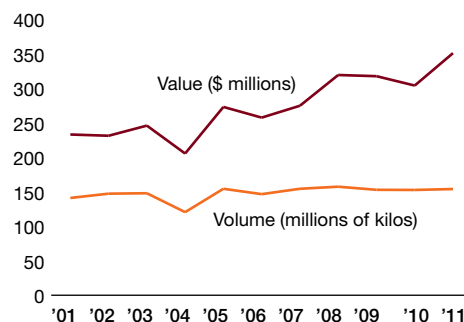
Between 2002 and 2011, chicken production (in kilograms) in British Columbia has been stable (excluding 2004) averaging about 148.8 million kilograms of chicken per year (Figure 8). In 2004, an outbreak of avian influenza (AI) in the Fraser Valley reduced chicken production by 18% from the previous year. Since then, the chicken industry has recovered and in 2011 BC chicken production was 4.1% higher than the year prior to the AI outbreak.

Because data on imports, exports, and interprovincial movements of final product is not always available at a provincial level due to confidentiality, it is difficult to measure the actual demand for chicken in BC. Instead, to calculate the disappearance of BC produced chicken, total BC production was used and adjusted to exclude 11% of production attributable to the market development (export) program with the exception of 2004 where no exports were assumed. Figure 9 shows that BC disappearance of chicken has been fairly stable other than 2004.

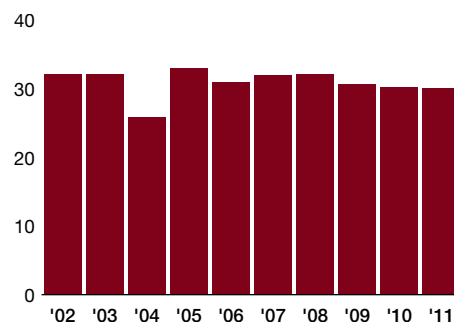
**Figure 7 Relative size of the chicken industry in BC and Canada, 2011 (%)**



**Figure 8 Volume and value of chicken production in BC<sup>6</sup>**



**Figure 9 Per capita disappearance of BC produced chicken (thousands of kilos per capita)<sup>7</sup>**



6. Chicken meat production is measured in eviscerated weight.

7. Per capita disappearance provides a proxy measure for total per capita consumption as data for the interprovincial movement of final products is not available.

Chicken producers directly generated approximately \$88.7 million towards provincial GDP and employ about **3,797 people** representing 14.5% of BC agriculture jobs.

About **8,869 jobs** are supported directly by poultry processors, hatching egg producers, hatcheries, chicken producers, and turkey producers with a further 4,808 in related industries.

Figure 10 illustrates that inflation in British Columbia has increased 3.3% per year since 1980.<sup>8</sup> Over the same period, the price received by poultry producers for their production has increased 1.9% per year. This implies that producer's incomes from poultry production have not increased as fast as the province's cost of living. It also suggests that food price increases have mostly occurred further along the value chain, during processing, distribution and at retail.

#### Employment and wages

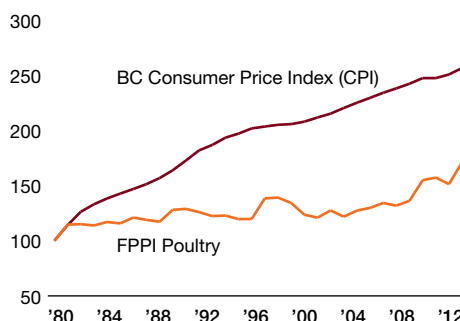
The chicken industry employs about 3,797 people and is responsible for approximately \$59.7 million in wages and salaries. Chicken producers employ 14.5% of the BC labour force in agriculture.

#### Investment and purchases

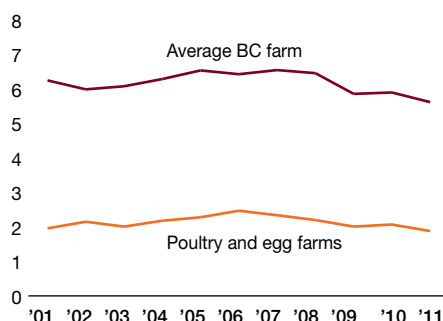
Investment in machinery and equipment (M&E) is important as it can help to improve farm efficiency. Before 2004, the average BC poultry farm<sup>9</sup> spent about 2% of its operational revenue in machinery expenses (Figure 11). After the AI outbreak, poultry farms appear to have increased their investment in M&E indicating these farms likely made investments to comply with new biosecurity standards. Since then, investment in M&E has declined to historic levels.

In 2011, BC chicken producers spent about \$90.7 million on chicks and other primary inputs, \$127.9 million on feed, supplements, and bedding, \$2.1 million on veterinary and breeding fees, and \$7.2 million on machinery expenses.<sup>10</sup>

**Figure 10 BC consumer price index (CPI) and farm product price index (FPPI) for poultry (1980=100)**



**Figure 11 Machinery expenses over operational revenue (%)**



8. Measured through CPI, which is the rate of price change for goods and services.

9. The definition of poultry farms includes the chicken, turkey, hatching egg, and table egg industries.

10. Statistics Canada poultry and eggs data was disaggregated by using the share of farm cash receipts from chicken, turkey, hatching egg, and table egg industries.



Chicken farms account for about **13.4%** of total farm cash receipts in British Columbia.



### BC chicken industry value chain

The BC chicken industry value chain methodology follows the distinct stages of production in the material flow from chicken producers to primary and further processors (Wholesale and retail sales to final consumers have been excluded from this analysis).

The chicken industry is comprised of several industries cooperating to produce chicken and processed chicken products for consumers, such as hatcheries, broiler chicken producers, processors, further processors, wholesalers and retailers.<sup>11</sup> In 2011, there were 8 hatcheries, 15 primary processing plants, and 33 further processing plants in BC. Also, the feed and animal medicine industries, transportation and packaging industries, and equipment suppliers are important industries that support the chicken industry. Figure 12 presents the chicken industry value chain.

### Economic impact of value chain for poultry (chicken, turkey and hatching egg industries)

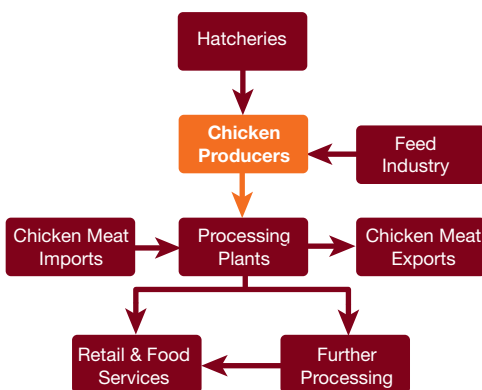
In this section we present the economic impact of the poultry, (chicken, turkey and hatching egg) value chain.

The impacts summarized in this section reflect the entire value chain for poultry but it is important to note that because

BCDEPI products are inputs into the final manufacturing process, their activity results in indirect, or downstream, impacts of final demand or output. To provide an understanding of how these downstream impacts are accounted for in our estimates, we have provided a detailed illustration of economic impacts, by value chain segment, in Appendix C.

Detailed economic impacts for each BCDEPI commodity is provided as Appendix D.

Figure 12 BC chicken industry value chain



11. Primary processing plants slaughter the birds and prepare the meat for the retail and food service markets, while further processing plants produce consumer-ready products such as chicken nuggets and pot pies.



Approximately \$102.8 million in municipal, provincial, and federal taxes are generated directly and indirectly by the poultry industry.

BC poultry value chain

The economic impact of the BC poultry industry is summarized in Table 2 below. Overall, the BC poultry industry accounts for 43% of estimated BCDEPI aggregate output; 44% of estimated BCDEPI generated GDP; 43% of employment, 48% of salaries and wages; and 46% of tax revenue.

In total, the BC poultry industry generates approximately \$2.4 billion in economic output, including \$712.4 million in GDP. The GDP total includes \$258.5 million from poultry processors, \$11.2 million from hatching egg producers, \$15.5 million from hatcheries, \$88.7 million from chicken producers, \$11.5 million from turkey producers, and \$258.4 million from other related economic activity.

Approximately 8,869 jobs are supported directly by poultry processors, hatching egg producers, hatcheries, chicken producers, and turkey producers, with a further 4,808 in related industries.

Finally, approximately \$102.8 million in taxes are generated directly and indirectly by the poultry industry.

Table 2 Economic impact of the BC poultry industry, 2011 (\$'000s)

Impact	Direct	Indirect	Induced	Total
Output	1,141,896	1,144,575	125,609	2,412,080
GDP (value added)	258,536	385,392	68,514	712,442
Wages & Salaries	189,453	212,567	37,789	439,809
Taxes	43,392	35,399	23,980	102,771
Employment (FTE)	3,958	8,634	1,085	13,677

## 3.3 British Columbia turkey industry

### Supply management in the turkey industry

The British Columbia Turkey Marketing Board (BCTMB) was established in 1966. It has the authority to regulate the production of all turkey grown for either meat or eggs in British Columbia. The BCTMB allocates the production of turkey to individual producers and ensures production happens within their allocation. It also licenses producers and processors, promotes turkey products, and sets the producer price in negotiations with processors.

### Volume and revenues

In 2011, British Columbia produced 24.9 million kilograms of turkey valued at \$45.7 million, which represents 1.7% of total farm cash receipts in the province. BC turkey production ranks third among Canadian provinces accounting for 12.9% of all Canadian turkey farm cash receipts (Figure 13).

Between 2002 and 2011, turkey production (in kilograms) in British Columbia has experienced a modest increase in production (Figure 14). In 2004, the province experienced an AI outbreak in the Fraser Valley, which reduced turkey production by 19% from

the previous year. However, the industry has been able to recover from the consequences of the outbreak. In 2005, BC turkey farmers were already producing 24% more turkey meat than the year prior to the outbreak. Since 2005, turkey production has stabilized at around 20.6 million kilos per year. After 2004, the per capita disappearance of turkey meat in British Columbia initially increased to reach a high of 5.1 kilos per person in 2008, however, the per capita disappearance has now stabilized at around 4.2 kilos per person. (Figure 15). Although since 2002, the value of turkey production has increased by 72%.

Figure 13 Relative size of the turkey industry in BC and Canada, 2011 (%)

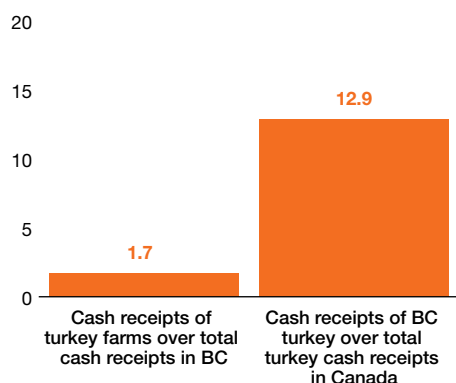


Figure 14 Volume and value of turkey production in BC

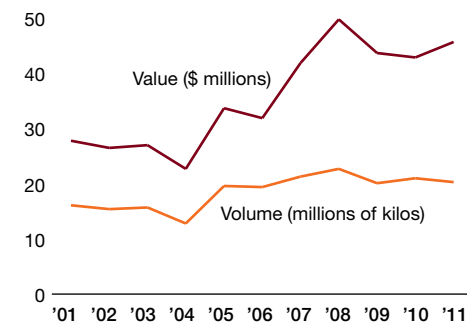
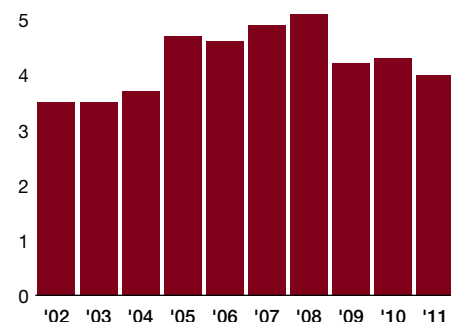


Figure 15 Per capita disappearance of turkey in BC (thousands of kilos per capita)<sup>12</sup>



BC's turkey producers generate approximately \$94.8 million in economic output in direct, indirect, and induced impacts, of which close to **\$31.8 million** can be considered contribution towards GDP.

12. Per capita disappearance provides a proxy measure for total per capita consumption as data for the interprovincial movement of final products is not available.





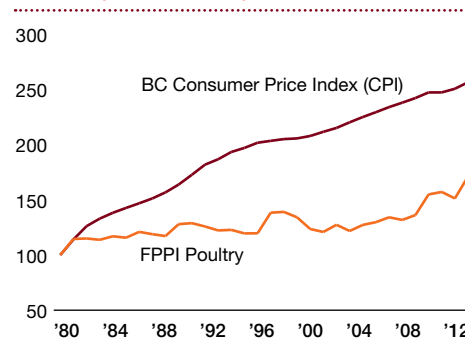
Turkey farms account for about **1.7%** of total farm cash receipts in British Columbia.

In 2011, there were **63 turkey farms** in British Columbia producing about 25.0 million kilograms of meat and generating \$45.7 million in farm cash receipts.

The decrease in per capita disappearance of turkey since 2008 may be attributed to the increase in value as the average live price for turkey in British Columbia increased by 9.1% from 2010 to 2011.<sup>13</sup> Consumer demand for turkey meat products is also influenced by comparative prices of alternative products.

Figure 16 illustrates that inflation in British Columbia has increased 3.3% per year since 1980.<sup>14</sup> Over the same period, the price poultry producers received for production has increased 1.9% per year. This implies that BC farmer's incomes related to poultry production have not increased as fast as the provincial cost of living. This also suggests that food price increases have mostly occurred further along the value chain, during processing, distribution and at retail.

**Figure 16 BC consumer price index (CPI) and farm product price index (FPPI) for poultry (Index 1980=100)**



#### Employment and wages

Turkey producers employ about 494 people and are responsible for about \$7.8 million in direct wages and salaries. Turkey farm employees make up 1.9% of BC's agricultural labour force.

#### Investment and purchases

Investment in machinery and equipment (M&E) is important as it can help to improve farm efficiency. Before 2004, the average BC poultry farm spent about 2% of its operational revenue in machinery expenses (Figure 11).<sup>15</sup> After the AI outbreak, poultry farms appear to have increased their investment in M&E indicating these farms likely made investments to comply with new biosecurity standards. Since then, investment in M&E has declined to historic levels.

In 2010, BC turkey farms spent about \$10.8 million on turkey poults and other primary inputs, \$15.3 million on feed, supplement, bedding, \$0.3 million on veterinary and breeding fees, and \$0.9 million on machinery expenses.<sup>16</sup>

13. Turkey contains less saturated fat and cholesterol than red meat, chicken, and most fish and shellfish.

14. Measured through CPI, which is the rate of price change for goods and services.

15. The definition of poultry farms includes the chicken, turkey, hatching egg, and table egg industries.

16. Statistics Canada poultry and eggs data was disaggregated by using the share of farm cash receipts from chicken, turkey, hatching egg, and table egg industries.

### BC turkey industry value chain

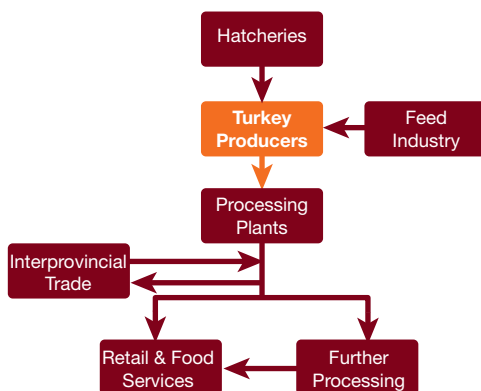
The BC turkey industry value chain methodology follows the distinct stages of production in the material flow from turkey producers to primary and further processors (Wholesale and retail sales to final consumers have been excluded from this analysis).

BC's turkey industry is comprised of several industries cooperating to produce turkey and processed turkey products for consumers, such as breeders and breeder growers, hatching egg producers, hatcheries, turkey producers, processors, further processors, wholesalers and retailers. In addition to the 63 registered turkey producers, BC is also home to 4 processing plants, and 1 hatchery. Also, the feed and animal medicine industries, transportation and packaging industries, and equipment suppliers are important allied industries that support the turkey industry.

Hatcheries are important in the turkey supply chain as they link turkey hatching egg producers and turkey producers. Primary processing plants receive the birds from the producers and then prepare the meat for the retail and food service markets. Further processing plants produce consumer-ready products such as deli meats, pot pies and sausages. Figure 17 illustrates the turkey industry value chain.

Wages and salaries in the turkey producing industry were approximately \$14.3 million for about **854 people** employed with 494 workers or 1.9% of BC agriculture jobs directly employed in turkey production.

Figure 17 BC Turkey Industry Value Chain



Approximately **\$4.9 million** in municipal, provincial, and federal taxes are generated directly and indirectly by turkey production.

## 3.4 British Columbia broiler hatching egg industry

### Supply management in the broiler hatching egg industry

The British Columbia Broiler Hatching Egg Commission (BCBHEC) was created in 1988. It oversees the production activities of BC broiler hatching egg producers, regulates the marketing of their product, and acts as a leader for the BC broiler hatching egg producers in dealings with other participants of the chicken meat industry.

BC's hatching egg producers generate approximately \$92.1 million in economic output in direct, indirect, and induced impacts, of which close to **\$30.9 million** can be considered contribution towards GDP.

In 2011, there were **53 hatching egg farms** in British Columbia producing about 8.7 million dozen eggs and generating \$44.4 million in farm cash receipts.



Hatching egg farms account for about **1.7%** of total farm cash receipts in British Columbia.



Wages and salaries in the hatching egg producing industry were approximately \$13.9 million for about **830 people** employed with 480 workers or 1.8% of BC agriculture jobs directly employed in hatching egg production.

### Volume and revenues

In 2011, British Columbia produced 8.7 million dozen hatching eggs valued at \$44.4 million, which represents 1.7% of the total farm cash receipts in the province. The BC broiler hatching egg industry is small relative to other supply management industries in the province, but is significantly large when compared to the Canadian broiler hatching egg industry. The BC hatching egg industry represents 16.5% of all Canadian hatching egg farm cash receipts (Figure 18).

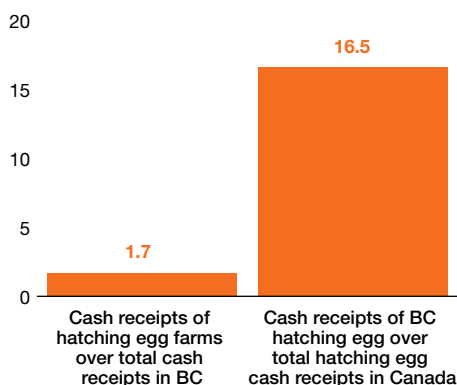
Production of hatching eggs (number of eggs) in British Columbia declined 40% from 2003 to 2004 due to the outbreak of avian influenza (AI) in the Fraser Valley. Immediately after 2004, the hatching egg industry grew rapidly although production has not fully recovered to previous volumes and has been declining since 2007. In 2011, production was 11% lower than the year prior to the outbreak (Figure 19).

Excluding 2004 and 2005 due to the AI outbreak, BC hatching egg producers have consistently supplied between 80 and 85% of the provincial demand. Based on supply patterns pre-NAFTA, a bilateral agreement was negotiated through the WTO that allows 20% of BC hatching eggs to be imported from the United States. (Figure 20).

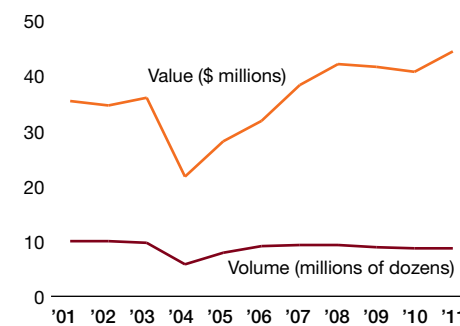
### Employment and wages

The industry employs about 480 people and is responsible for about \$7.5 million in wages and salaries. Hatching egg farmers employ 1.8% of BC's agricultural workers.

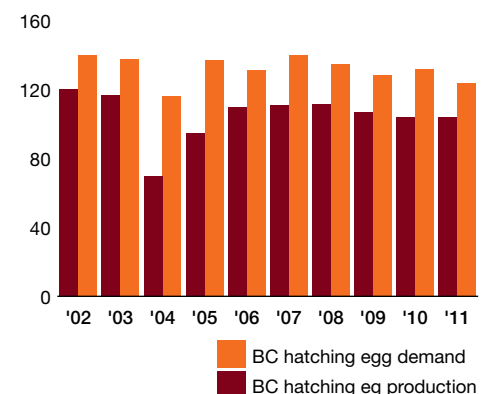
**Figure 18 Relative size of the hatching egg industry in BC and Canada, 2011(%)**



**Figure 19 Volume and value, hatching egg production in BC**



**Figure 20 Demand and production hatching eggs, BC (millions of eggs)**



Approximately **\$4.8 million** in municipal, provincial, and federal taxes are generated directly and indirectly by hatching egg production.

#### Investment and purchases

Investment in machinery and equipment (M&E) is important as it can help to improve farm efficiency. Before 2004, the average BC poultry farm spent about 2% of its operational revenue on machinery expenses (Figure 11).<sup>17</sup> After the AI outbreak, poultry farms appear to have increased their investment in M&E indicating these farms likely made investments to comply with new biosecurity standards.

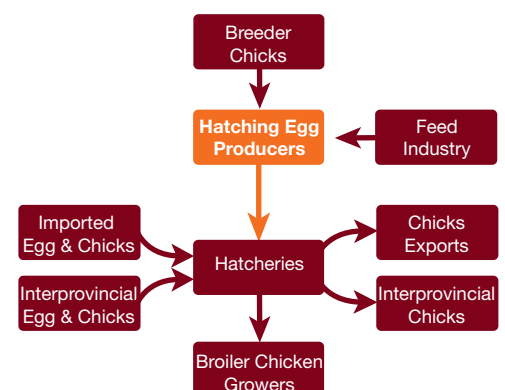
In 2011, the BC broiler hatching egg producers spent about \$13.8 million on laying birds and other primary inputs, \$19.5 million on feed, supplement, and bedding, \$0.3 million on veterinary and breeding fees, and \$1.1 million on machinery expenses.<sup>18</sup>

#### BC hatching egg industry value chain

The value chain methodology for hatching eggs follows the distinct stages of production in the material flow from hatching egg producers to broiler chicken producers.

The hatching egg industry output is the main input for the chicken industry, which makes the dependency of these two industries on each other unique. The hatching industry involves breeders and breeder growers, hatching egg producers, hatcheries, and broiler chicken growers as illustrated in Figure 21 below. There are 5 hatchery facilities in BC, 4 are located in the Fraser Valley and 1 in the Okanagan. The feed and animal medicine industries, transportation and packaging industries, and equipment suppliers are important allied industries for the hatching egg industry operations.

Figure 21 BC hatching egg industry value chain



17. The definition of poultry farms includes the chicken, turkey, hatching egg, and table egg industries.

18. Statistics Canada poultry and eggs data was disaggregated by using the share of farm cash receipts from chicken, turkey, hatching egg, and table egg industries.

## 3.5 British Columbia table egg industry

### Supply management in the table egg industry

The British Columbia Egg Marketing Board (BCEMB) was created in 1967 and is the provincial body authorized to promote, control, and regulate the production and movement of all eggs in the province. It is also responsible for setting prices for producers within its jurisdiction, using the Egg Farmers of Canada's cost-of-production formula. The cost of production formula is calculated based on what it would cost an efficient farmer to produce eggs. Table eggs are sold to grading stations and producers receive the price set by the BCEMB. Graders then sell these eggs to wholesalers, retailers, hotels, restaurants and breaking plants (further processors).

### Volume and revenues

In 2011, British Columbia produced 70.4 million dozens of table eggs valued at \$127.6 million, which represents 4.9% of total farm cash receipts in BC and 16.9% of all Canadian table egg farm cash receipts (Figure 22).

Between 2001 and 2011, the production of table eggs in British Columbia increased (Figure 23) even with the 2004 outbreak of avian influenza (AI). Following measures to contain and eliminate the outbreak, egg production dropped 37% from the previous year. Since 2004, the BC table egg industry has been recovering from the outbreak and in 2011 egg production was 15.9% higher than 2003 levels.

Figure 22 Relative size of the table egg industry in BC and Canada, 2011 (%)

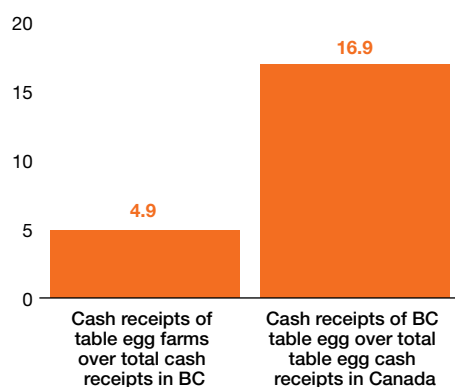
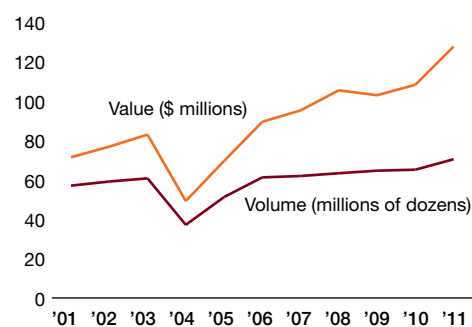


Figure 23 Volume and value of table egg production in BC





In 2011, there were 136 table egg farms in British Columbia producing about **70 million dozen eggs** and generating \$128 million in farm cash receipts.



Table egg producers generated approximately \$32.2 million towards provincial GDP employing an estimated **1,379 workers** representing 5.3% of BC agriculture jobs.



Approximately **\$13.8 million** in municipal, provincial, and federal taxes are generated directly and indirectly by table egg producers.

About **2,185 jobs** are supported directly by table egg producers and processors, with a further 314 in related industries.

As a result of the AI outbreak consumer demand for table eggs experienced a significant decline. Since 2005, demand has increased and was relatively stable until 2011 (Figure 24). This increase is comparable to the overall national consumer trend for egg consumption which at 16.8 dozen per person of eggs in 2011, was above the five-year average of 16.2 dozen per person.<sup>19</sup>

Figure 25 illustrates that inflation<sup>20</sup> in British Columbia has increased 3.3% per year since 1980. Over the same period, the price egg producers received for production

increased 2.1% per year. This implies that BC farmer's incomes related to egg production has not increased as fast as the province's cost of living. This also suggests that food price increases have mostly occurred further along the value chain, during processing, distribution and at retail.

### Employment and wages

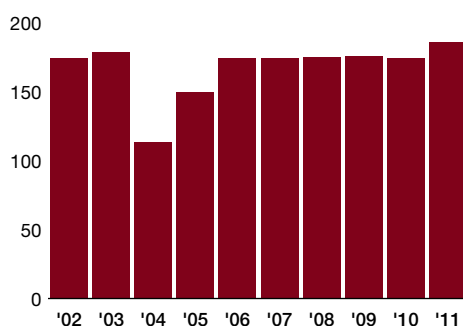
The industry employs about 1,379 people and is responsible for about \$21.7 million in wages and salaries. Egg farmers employ 5.3% of BC's agricultural labour force.

### Investment and purchases

Investment in machinery and equipment (M&E) is important as it can help to improve farm efficiency. Before 2004, the average BC poultry farm<sup>21</sup> spent about 2% of its operational revenue on machinery expenses. After the AI outbreak, poultry farms appear to have increased their investment in M&E indicating these farms likely made investments to comply with new biosecurity standards.

In 2011, table egg producers in BC spent about \$27.8 million on laying birds and other primary inputs, \$39.2 million on feed, supplement, and bedding, \$0.6 million on veterinary and breeding fees, and \$2.2 million on machinery expenses.<sup>22</sup>

**Figure 24 Per capita demand for table eggs in BC (number of eggs per capita)**



**Figure 25 BC consumer price index (CPI) and farm product price index (FPPI) for table eggs (Index 1980=100)**

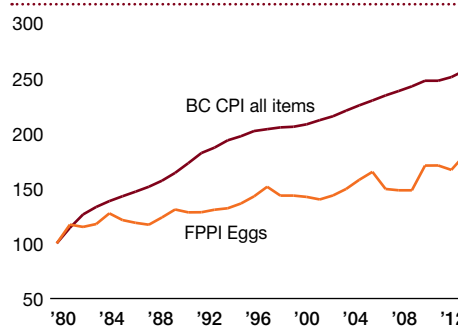


Table egg producers accounted for approximately **4.9%** of total farm cash receipts in British Columbia.

19. Food Statistics, Statistics Canada Cansim Table 0020-0019 (values not adjusted for losses)

20. Measured through CPI, which is the rate of price change for goods and services.

21. The definition of poultry farms includes the chicken, turkey, hatching egg, and table egg industries.

22. Statistics Canada poultry and eggs data was disaggregated by using the share of farm cash receipts from chicken, turkey, hatching egg, and table egg industries.

#### BC table egg industry value chain

The value chain methodology for the table egg industry follows the distinct stages of production in the material flow from egg producers to processors (wholesale and retail are excluded from this analysis).

The extended table egg industry is comprised of different industries cooperating to produce table eggs and processed egg products to consumers, such as breeders and breeder growers, pullet growers, table egg producers, graders, breaker plants, wholesale and retailers.

In the table egg industry value chain, grading plants are responsible for picking up the eggs from the farm, washing, grading the eggs, and packing them for the retail or food service industries. Egg graders are located on Vancouver Island and the Fraser Valley. Breaking plants receive approximately 18% of all egg production in British Columbia that goes towards the production of liquid, frozen, or dried egg products. Figure 26 illustrates the table egg industry value chain.

#### Economic impact of BC's table egg value chain

The impacts summarized in this section reflect the entire value chain for table eggs but it is important to note that because BCDEPI products are inputs into the final manufacturing process, their activity results in indirect, or downstream, impacts of final demand or output. The methodology used to estimate egg grader revenues has been revised in this report to accommodate data now publicly available from Agriculture Canada. Revenue estimates were based on assumptions made on the weighted average producer and retailer prices for table eggs. To provide an understanding of how these downstream impacts are accounted for in our estimates, we have provided a detailed illustration of economic impacts, by value chain segment, in Appendix C. Detailed economic impacts for each BCDEPI commodity is provided as Appendix D.

#### BC table egg value chain

The economic impact of the BC table egg industry is summarized in Table 3 below. Similar to previous years, the BC table egg industry accounts for a relatively modest portion of the overall aggregate impacts at 8% of estimated BCDEPI aggregate output; 8% of estimated BCDEPI generated GDP; 8% of employment; 9% of salaries and wages; and 8% of tax revenue.

In total, the BC table egg industry generates approximately \$440.6 million in economic output, including \$130.1 million in GDP. The GDP total includes \$60.5 million from egg graders and breakers, \$32.2 million from table egg producers, and \$37.4 million from other related and induced economic activity.

Approximately 2,185 jobs are supported directly by table egg producers and processors, with a further 314 in related industries. Finally, approximately \$18.8 million in taxes are generated directly and indirectly by the table egg industry.

Figure 26 BC table egg industry value chain

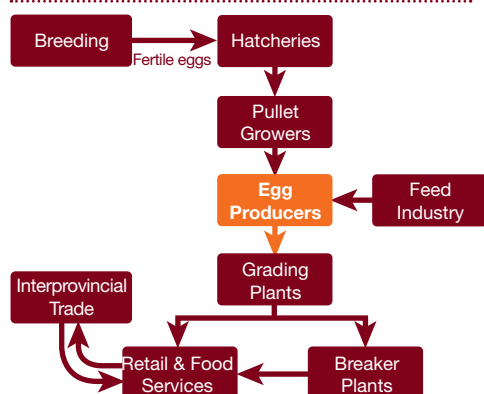


Table 3 Economic impact of the BC table egg industry, 2011 (\$'000s)

Impact	Direct	Indirect	Induced	Total
Output	208,567	209,056	22,942	440,565
GDP (value added)	60,484	57,129	12,514	130,127
Wages & Salaries	34,604	38,825	8,505	81,934
Taxes	7,926	6,466	4,380	18,772
Employment (FTE)	805	1,495	198	2,498



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Approximately **\$18.8 million** in municipal, provincial, and federal taxes are generated directly and indirectly by the table egg industry.

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BC's table egg industry value chain generated approximately **\$440.6 million** in economic output contributing an estimated \$130.1 million in GDP to BC's economy.

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# 4 Summary tables and charts

## Summary of industry profiles

There are 1,100 producers in British Columbia under the supply management system (Table 4). The dairy industry represents nearly half of all BCDEPI producers, followed by the chicken, table egg, turkey and hatching egg industries, respectively. Dairy, chicken, and table egg production are the most labour intensive of the BCDEPI industries employing, on average, 11 employees per producer. This demonstrates a significant employment growth (67%) in the table egg industry since 2009. In 2011, turkey production represented the least labour intensive industry employing, on average, 8 workers per producer.

Table 5 illustrates the importance of the supply managed industries relative to the British Columbia agriculture sector. The combined BCDEPI industries account for just over 40% of all BC farm cash receipts and nearly half of all BC agriculture workers.

Table 6 illustrates the farm cash receipts and expenditures associated with each supply-managed commodity. It shows that BC supply managed industries allocate, on average, 39% of their revenues to feed, 35% to general expenses, 17% to wages and salaries, and 6% to purchases of machinery and equipment.

## Estimated economic impacts of the total value chain

### BCDEPI value chain aggregate impact

The BCDEPI value chain impacts the BC economy through direct expenditures on goods and services, employing workers and generating tax revenues for local, provincial and federal governments. Aggregate impacts for the BCDEPI value chain are detailed in Table 7.

Table 8 provides a comparison of the economic impacts between 2007, 2009 and 2011.

The following sections provide further detail for the economic impact estimates provided in Tables 7 and 8.

**Table 4 Number of producers and workers, 2011**

	Number of Producers	Employment	Average Employee	Production Volume (million)
Dairy	517	5,653	11	666.0 litres
Chicken	331	3,797	11	154.0 kilos
Table Egg	136	1,379	10	70.4 dozen eggs
Turkey	63	494	8	24.9 kilos
Hatching Egg	53	480	9	8.7 dozen eggs
BCDEPI	1,100	11,803	11	

**Table 5 Share of supply management farms of BC agriculture sector, 2011**

	Farm Receipts (\$ million)	Share of Total BC Cash Receipts	Employment	Share of BC Agriculture Jobs
Dairy	\$522.8	20.0%	5,653	21.5%
Chicken	\$351.1	13.4%	3,797	14.5%
Table Egg	\$127.6	4.9%	1,379	5.3%
Turkey	\$45.7	1.7%	494	1.9%
Hatching Egg	\$44.4	1.7%	480	1.8%
BCDEPI	\$1,091.6	41.8%	11,803	45.2%

**Table 6 Farm cash receipts and expenditures, 2011 (\$ million)**

	Farm Receipts	Cattle, Poultry or Egg Purchases	General Expenses	Machinery	Wages & Salaries	Feed	Veterinary & Breeding Fees
Dairy	\$522.8	\$55.7	\$268.1	\$54.9	\$88.9	\$228.7	\$28.3
Chicken	\$351.1	\$90.7	\$70.8	\$7.2	\$59.7	\$127.9	\$2.1
Table Egg	\$127.6	\$27.8	\$21.7	\$2.2	\$21.7	\$39.2	\$0.6
Turkey	\$45.7	\$10.8	\$8.4	\$9	\$7.8	\$15.3	\$0.3
Broiler Hatching Egg	\$44.4	\$13.8	\$10.8	\$1.1	\$7.5	\$19.5	\$0.3
BCDEPI	\$1091.6	\$198.8	\$379.8	\$66.3	\$185.6	\$430.6	\$31.5

## Output

Total output directly generated by the BCDEPI value chain is estimated to equal \$2.5 billion, an 5.9% increase from 2007. Direct output supports a further estimated \$2.8 billion in indirect output in the BC economy (a 16.6% increase from 2007) and stimulates an additional \$272.7 million in induced economic impacts (a 5.9% increase from 2007). Total output generated or supported by BCDEPI in the BC economy is therefore estimated at \$5.6 billion, an 11% increase from \$5 billion in 2007.

## GDP

Economic output supported by the BCDEPI value chain is estimated to be \$1.6 billion in nominal GDP. BC nominal GDP in 2011 was equal to approximately \$195.7 billion therefore, the estimated magnitude of the supply managed sector's GDP impact remains unchanged from 2007 and amounts to about 0.8% of the BC economy. Recognizing that contributions to GDP from the BCDEPI value chain are not as large as from other sectors of BC's economy, in contrast, BCDEPI experiences less volatility in response to changing market conditions.

## Employment and wages and salaries

Economic activity generated by the BCDEPI value chain is estimated to support 31,726 jobs with \$917.8 million in associated wages and salaries, a 2.7% increase from 2007. With approximately 2.3 million people employed in BC at the end of 2011, the estimated employment impacts increased slightly representing 1.4% of total BC employment.

Table 9 compares the employment contributions of the BCDEPI value chain against other BC industry sectors. The comparison indicates that in 2011, the BCDEPI value chain generated more jobs than both the forestry and logging sector, and the mining and oil & gas extraction sector.

Additional analysis indicates that over the past ten years, between 2002 and 2011, the forestry and logging sector experienced a negative 4.4% average annual change in employment demonstrating a highly volatile labour force sector.

In contrast, components of the BCDEPI value chain have experienced relatively stable employment even during times of economic instability as experienced since 2008.

## Tax revenue

Aggregate taxes generated by the BCDEPI value chain are estimated to be close to \$223 million. Approximately \$119 million is estimated to accrue to the Federal government; a further \$82 million is estimated to flow to the Provincial government with the remaining \$22 million going to municipal governments.

## Conclusions

The analysis presented in this study has shown that the supply managed commodities produce significant economic benefits for the British Columbian economy. Economic impacts across the entire BCDEPI value chain are estimated to be \$1.6 billion in value-added, based on total value chain output of \$5.6 billion. The value-added produced by the BCDEPI value chain in British Columbia corresponds with approximately 0.8% of BC's GDP. The economic activities of the BCDEPI value chain were also responsible for the employment of approximately 31,726 individuals, providing \$917.8 million in annual salaries and wages.

**Table 7 BCDEPI economic impacts summary table, 2011 (\$'000s)**

Impact	Direct	Indirect	Induced	Total
Output	2,479,403	2,802,310	272,734	5,554,447
GDP (value-added)	552,582	922,911	148,764	1,624,257
Wages & Salaries	341,828	495,298	80,686	917,812
Taxes	94,217	76,861	52,067	223,145
Employment (FTE)	6,944	22,427	2,355	31,726

**Table 8 BCDEPI Total economic impacts summary table, % change from 2007 – 2011 (\$'000s)**

Impact	2007	2009	2011	% change
Output	5,000,792	5,257,755	5,554,447	11.1%
GDP (value-added)	1,561,638	1,566,964	1,624,257	4.0%
Wages & salaries	893,720	949,509	917,811*	2.7%
Taxes	205,983	211,856	223,146	8.3%
Employment (FTE)	28,375	26,843	31,726	11.8%

\* The decrease in wages and salaries from 2009 to 2011 is attributable to an adjustment in the methodology used to estimate egg processing revenues.

**Table 9 Employment comparison of major BC industries, 2011**

	Employment ('000s)	Share of Provincial Total (%)
Total BCDEPI Value Chain	31.7	1.4%
Accommodation and food services	181.8	8.0%
Forestry and Logging (plus support services)	14.0	0.6%
Mining and Oil & Gas Extraction (plus support services)	24.7	1.1%
British Columbia	2,274.7	100%

Source: Statistics Canada and PwC



# *Appendices*



# Appendix A

## List of Sources

Annual Report, 2011, Canadian Hatching Egg Producers  
Annual Report 2011/2012 Dairy Year, BC Milk Marketing Board  
Annual Report 2011, BC Chicken Marketing Board  
Annual Report 2011, BC Egg Marketing Board  
Annual Report 2011, BC Broiler Hatching Egg Commission  
Annual Report 2011, BC Turkey Marketing Board and BC Turkey Association  
Agriculture, Aquaculture and Food Fast Stats, BC Ministry of Agriculture, 2010  
Canadian Turkey Facts, 1974-2011, Canadian Turkey Marketing Agency  
Cash Receipts from Milk and Cream, CANSIM Table 003-0008, Statistics Canada  
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Milk Production and Utilization, CANSIM Table 003-0011, Statistics Canada  
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Production, Disposition and Farm Value of Poultry Meat, CANSIM Table 003-0018, Statistics Canada  
Production and Disposition of Eggs, CANSIM Table 003-0020, Statistics Canada  
Statistics of the Canadian Dairy Industry, Agriculture and Agri-Food Canada, 2012

# Appendix B

## Economic impact data sources

Provincial industry multipliers were obtained from both Statistics Canada and BC Stats. While the data sets are based on common underlying data, Statistics Canada data contains a higher disaggregation of industries than BC Stats (285 versus 66). However, BC Stats includes induced effects and government revenues for all three levels of government, which are not included in the Statistics Canada data. For this reason, both sets of multipliers were employed in this study in an effort to produce a wider range of economic impact estimates.

Additional data was obtained from CANSIM, which publishes values based on farm cash receipts for producers, or value of shipments for processors.

The list of data sources used for the study is presented below.

### Multipliers

When using the Statistics Canada data, multipliers for the following industry aggregations were used:

#### NAICS 112A00: Animal Production (except Animal Aquaculture)

This subsector comprises establishments, such as ranches, farms and feedlots, primarily engaged in raising animals, producing animal products and fattening animals.

#### NAICS 311500: Dairy Product Manufacturing

This industry group comprises establishments primarily engaged in manufacturing dairy products.

#### NAICS 311615: Poultry Processing

This industry comprises establishments primarily engaged in slaughtering poultry and small game or preparing processed poultry and small game meat and meat by-products.

#### NAICS 3119A0: Other Miscellaneous Food Manufacturing

This industry comprises establishments, not classified to any other industry, primarily engaged in manufacturing food, including egg processing.

When using the BC Stats data, multipliers for the following industry aggregations were used:

#### NAICS 111 & 112: Crop and Animal Production

This subsector is the combination of both crop and animal production. It is comprised of establishments, such as farms, orchards, groves, greenhouses and nurseries, primarily engaged in growing crops, plants, vines, trees and their seeds (excluding those engaged in forestry operations), or establishments, such as ranches, farms and feedlots, primarily engaged in raising animals, producing animal products and fattening animals.

#### NAICS 311: Food Manufacturing

This subsector comprises establishments primarily engaged in producing food for human or animal consumption.

### Output

Output data was obtained from CANSIM, which publishes output values based on farm cash receipts for producers, or value of shipments for processors. The specific CANSIM table is listed for each industry below.

**Dairy Production:** CANSIM Table #003-0008 – Cash receipts from milk and cream sold off farms

**Chicken and Turkey Production:** CANSIM Table #003-0018 – Production, disposition and farm value of poultry meat

**Hatching and Table Egg Production:** CANSIM Table # 003-0020 – Production and disposition of eggs

**Dairy Processing:** CANSIM Table #304-0015 – Sales of goods manufactured (shipments); unadjusted, by sector and NAICS; British Columbia; Dairy product manufacturing [NAICS 311500]

**Poultry Processing:** CANSIM Table #304-0015 – Sales of goods manufactured (shipments); unadjusted, by sector and NAICS; British Columbia; Poultry processing [NAICS 311615]

**Eggs Processing:** As egg processing is captured under NAICS 3119A0: Other Miscellaneous Food Manufacturing and aggregated along with several other unrelated activities, output data was obtained either directly from BC's breaking and grading plants or by using a weighted average estimate of table egg prices.

Output values were then applied to the appropriate industry multipliers to estimate direct, indirect, and induced output, value-added (GDP), exports, employment, wages and salaries, and government revenues.



# Appendix C

## Illustrated economic impacts of the BCDEPI value chain

### Dairy value chain

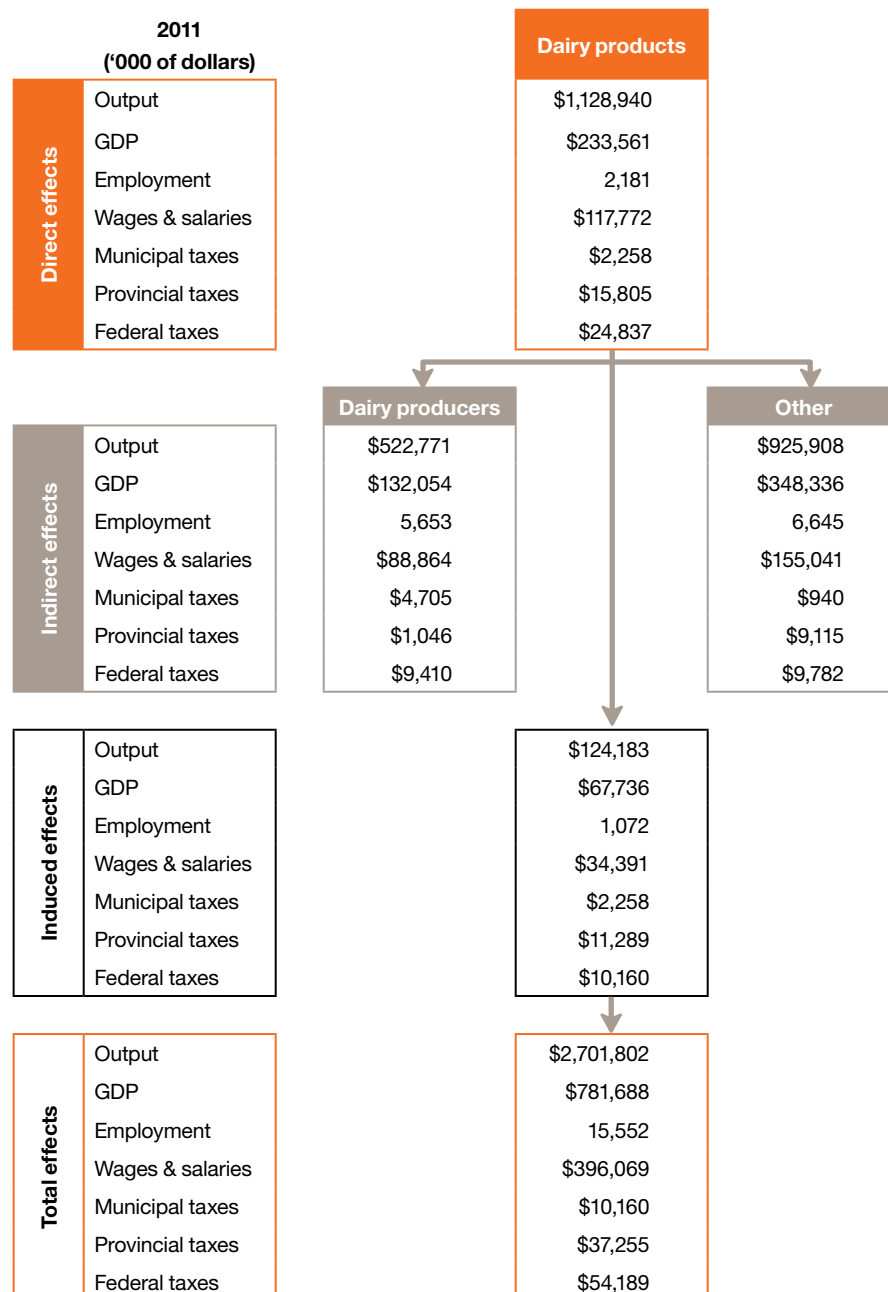
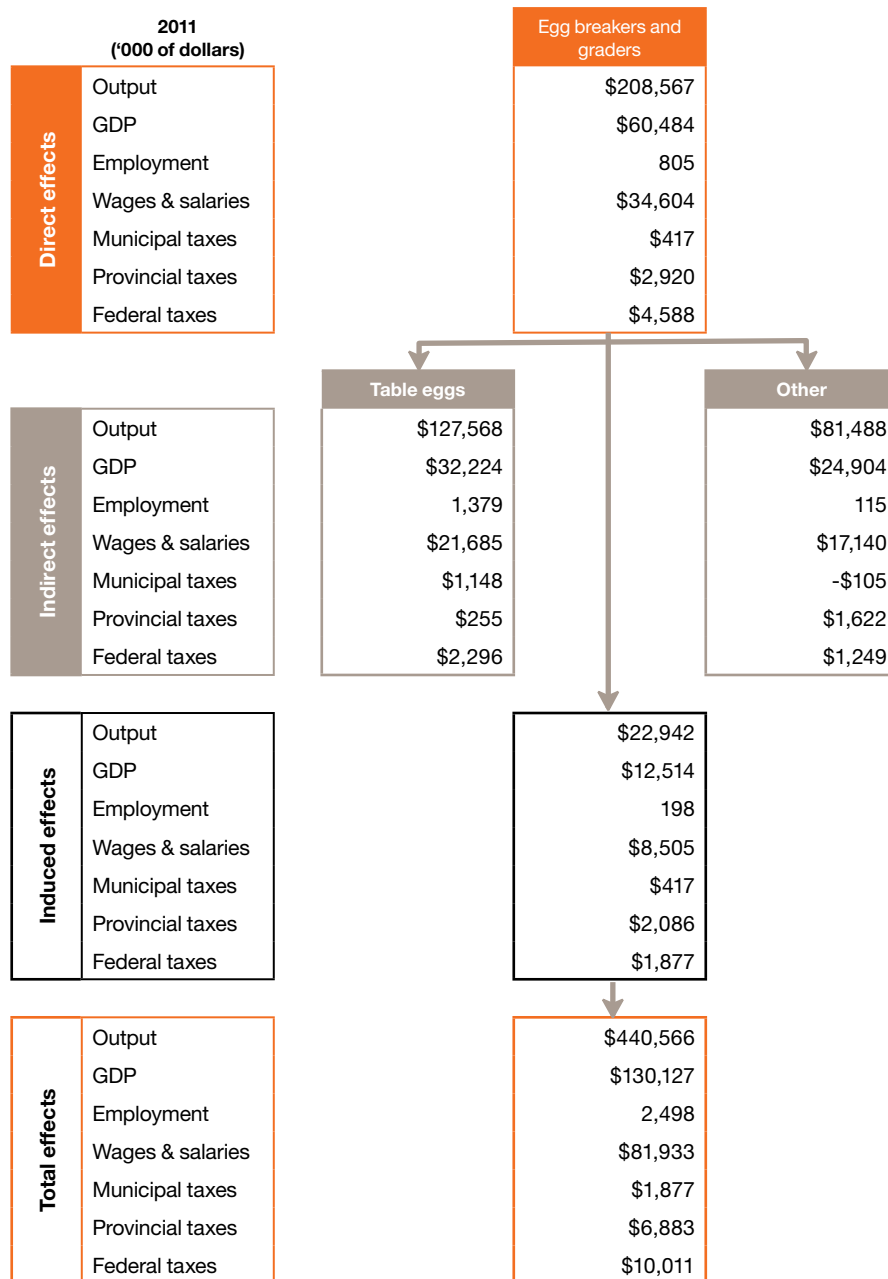


Table egg value chain



## Poultry processing

2011 ('000 of dollars)		Poultry processing				
Direct effects	Output	\$1,141,896				
	GDP	\$258,536				
	Employment	3,958				
	Wages & salaries	\$189,453				
	Municipal taxes	\$2,284				
	Provincial taxes	\$15,987				
	Federal taxes	\$25,122				
Indirect effects		Hatching egg	Hatcheries	Chicken	Turkey	Other
	Output	\$44,364	\$42,782	\$351,140	\$45,659	\$634,856
	GDP	\$11,207	\$15,522	\$88,699	\$11,534	\$258,430
	Employment	480	140	3,797	494	3,723
	Wages & salaries	\$7,541	\$11,374	\$59,689	\$7,761	\$126,201
	Municipal taxes	\$399	\$137	\$3,160	\$411	\$1,602
	Provincial taxes	\$89	\$960	\$702	\$91	\$8,435
	Federal taxes	\$799	\$1,508	\$6,321	\$822	\$9,963
Induced effects		\$125,609				
	GDP	\$68,514				
	Employment	1,085				
	Wages & salaries	\$37,789				
	Municipal taxes	\$2,284				
	Provincial taxes	\$11,419				
	Federal taxes	\$10,277				
Total effects		\$2,412,080				
	GDP	\$712,441				
	Employment	13,677				
	Wages & salaries	\$439,809				
	Municipal taxes	\$10,277				
	Provincial taxes	\$37,683				
	Federal taxes	\$54,811				



# Appendix D

## Economic impacts of BCDEPI commodities

BCDEPI	Dairy	Chicken	Turkey	Hatching egg	Table egg
2011 Farm cash receipts (*000 of dollars)	\$522,771	\$351,140	\$45,659	\$44,364	\$127,568
<b>Direct effects</b>					
Output	\$522,771	\$351,140	\$45,659	\$44,364	\$127,568
GDP	\$132,054	\$88,699	\$11,534	\$11,207	\$32,224
Employment	5,653	3,797	494	480	1,379
Wages & Salaries	\$88,864	\$59,689	\$7,761	\$7,541	\$21,685
Municipal Taxes	\$4,705	\$3,160	\$411	\$399	\$1,148
Provincial Taxes	\$1,046	\$702	\$91	\$89	\$255
Federal Taxes	\$9,410	\$6,321	\$822	\$799	\$2,296
<b>Indirect effects</b>					
Output	\$468,213	\$314,494	\$40,894	\$39,734	\$114,255
GDP	\$180,177	\$121,023	\$15,737	\$15,290	\$43,967
Employment	3,334	2,240	291	283	814
Wages & Salaries	\$58,447	\$39,258	\$5,105	\$4,960	\$14,262
Municipal Taxes	\$523	\$351	\$46	\$44	\$128
Provincial Taxes	\$9,933	\$6,672	\$868	\$843	\$2,424
Federal Taxes	\$13,069	\$8,779	\$1,141	\$1,109	\$3,189
<b>Total direct and indirect effects</b>					
Output	\$990,984	\$665,634	\$86,553	\$84,098	\$241,823
GDP	\$312,231	\$209,723	\$27,270	\$26,497	\$76,192
Employment	8,987	6,037	785	763	2,193
Wages & Salaries	\$147,311	\$98,947	\$12,866	\$12,501	\$35,947
Municipal Taxes	\$5,228	\$3,511	\$457	\$444	\$1,276
Provincial Taxes	\$10,978	\$7,374	\$959	\$932	\$2,679
Federal Taxes	\$22,479	\$15,099	\$1,963	\$1,908	\$5,485
<b>Induced effects</b>					
Output	\$94,099	\$63,205	\$8,219	\$7,986	\$22,962
GDP	\$52,277	\$35,114	\$4,566	\$4,436	\$12,757
Employment	789	530	69	67	193
Wages & Salaries	\$16,958	\$11,391	\$1,481	\$1,439	\$4,138
Municipal Taxes	\$1,568	\$1,053	\$137	\$133	\$383
Provincial Taxes	\$8,364	\$5,618	\$731	\$710	\$2,041
Federal Taxes	\$7,842	\$5,267	\$685	\$665	\$1,914
<b>Total effects</b>					
Output	\$1,085,083	\$728,839	\$94,772	\$92,084	\$264,785
GDP	\$364,508	\$244,837	\$31,836	\$30,933	\$88,948
Employment	9,777	6,567	854	830	2,386
Wages & salaries	\$164,269	\$110,338	\$14,347	\$13,940	\$40,085
Municipal taxes	\$6,796	\$4,565	\$594	\$577	\$1,658
Provincial taxes	\$19,343	\$12,992	\$1,689	\$1,641	\$4,720
Federal taxes	\$30,321	\$20,366	\$2,648	\$2,573	\$7,399



