

# 2001 CREAP Data (Version A) Documentation and Methods<sup>1</sup>

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The authors alone are responsible for any errors.

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# Chapter 1

## Overview

The CREAP<sup>1</sup> 2001 Version A data is microconsistent input-output data for Canada based on the L-level Input-Output data made available by Statistics Canada's Input-Output Division (Statistics Canada 2006c). The Version A data has some additional detail in the supply-managed sectors of primary agriculture.

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<sup>1</sup>Data and documentation are available at <http://creap.wlu.ca/>

## Chapter 2

# Output Table

The Canadian L-level output data features a high degree of commodity detail, but its sectoral detail for agrifood is poor. This section details the steps taken to disaggregate the crop and animal production output vector of the 2001 L-level Canadian output table to include the following sectoral detail: 1) raw milk; 2) chicken; 3) eggs; 4) turkey; and 5) other animals and crop production.

### 2.1 Data Employed

Statistics Canada data on average operating revenues and expenses by farm type for Canadian crop production (Statistics Canada 2006b) and animal production (Statistics Canada 2006a) was employed in the data disaggregation as well as Statistics Canada data on production of poultry meat (Statistics Canada 2006d).

### 2.2 Procedure

The farm revenue and expenditure data (hereafter referred to as the “budget” data) presents per-farm revenues from various outputs. The revenue data was first multiplied by the number of farms in each sector and the resulting values converted into millions. This table is reproduced in the appendix as A.2. This table offers a table roughly corresponding to our target matrix, but is much less detailed and is not based on IO concepts. Nonetheless it provides a good template for calculating revenue shares per dollar of sectoral activity (by sector) that can be applied to disaggregate the output vector.

The 2001 L-level national Output table has one sector comprising all of primary agriculture<sup>1</sup> The farm types represented by the budget data include crop production, beef cattle production, dairy cattle and milk production, hog production, poultry and egg production, and other animal production. The next step in the disaggregation was to aggregate the budget data farm categories, crop

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<sup>1</sup>This includes all crop and animal production, as well as dairy (raw milk) operations.

Table 2.1: Budget Data Revenue Categories

GOSR	total grains and oilseeds revenue
POTR	revenue from potatoes
FRUR	revenue from fruits
VEGR	revenue from vegetables
TOBR	tobacco revenue
GNFR	revenue from greenhouse nursery and floriculture products
FCRR	revenue from forage crops (including seeds)
OCR	revenue from other crops
CATR	cattle revenue
HGR	hogs revenue
PEGR	poultry and eggs revenue
DPRR	dairy products and subsidies revenue
OLPR	other livestock and products revenue
CWMR	custom work and machine rental
REN	rental income
MISR	miscellaneous revenues

production, beef cattle production, hog production and other animal production to create a single farming category called the “other animals and crop” sector.

Next, the budget data farm category, poultry and eggs, was disaggregated into: 1) poultry; and 2) eggs using shares generated from the L-level output data. Next, data on the production of poultry meat (Statistics Canada 2006d) was employed to disaggregate poultry into: 1) chicken; and 2) turkey.

At this point the budget data farm categories corresponded exactly to the sectoral disaggregation desired for the L-level national data. Revenue shares were calculated by dividing each entry by the total revenue associated with each revenue category. These shares were then applied to disaggregate the L-level agricultural output vector using an aggregation mapping that allocated outputs to the revenue classes identified in the budget data. Outputs of several classes of revenues that did not match with the output categories detailed in the budget data were mapped directly to the OAC sector. This mapping is reproduced in the appendix as table A.3.

Appendix table A.1 reports the resulting disaggregation of the L-level agri-food output vector.

## Chapter 3

# Input Table

This section supplies the methodology used to disaggregate the input vector of the 2001 L-level data. We employed the same raw data source as before, although this time the focus of our attention was on splitting the input data for each input good between the five subsectors identified.

### 3.1 Procedure

The 2001 L-level national Input table has one sector comprising all of primary agriculture. The budget data (Statistics Canada 2006b; Statistics Canada 2006a) provides per-farm expenditures on various inputs. Again, the data was first multiplied by the number of farms in each sector and the resulting values converted into millions. This table is reproduced in the appendix as A.5. This table offers a table roughly corresponding to our target matrix, but is much less detailed and is not based on IO concepts. Nonetheless it provides a good template for calculating cost shares per dollar of sectoral activity (by sector) that can be applied to disaggregate the input vector.

The farm types initially represented by the budget data include crop production, beef cattle production, dairy cattle and milk production, hog production, poultry and egg production, and other animal production. The next step in the input disaggregation was to create budget data farm categories that correspond exactly to the sectoral disaggregation desired for the L-level national data. This was achieved by applying shares calculated from the disaggregated output table completed in step one.

Then an aggregation mapping was prepared to allocate the L-level goods to the expenditure classes identified in the budget data. This mapping is reproduced in the appendix as table A.6.

A first guess of the input expenditure on each good by a given sector was calculated by allocating the L-level input of the good among sectors using the shares of expenditures in the corresponding expense category (from the budget

Table 3.1: Budget Data Expenditure Categories

PPMT	program payments and insurance proceeds
FERT	fertilizer and lime
PEST	pesticides
SEED	seed and plants
CTL	cattle purchases
HOGS	hog purchases
PEGG	poultry and egg purchases
OLP	other livestock purchases
FEED	feed, supplements, straw and bedding
VET	veterinary fees, medicine and breeding fees
FUEL	net fuel expenses, machinery, truck, auto
REPR	repairs, licenses and insurance
WAGE	salaries
RENT	rent
INSU	insurance
UTIL	utilities
CWRK	custom work and machine rental
BREP	building and fence repairs
NOI	net operating income

data).<sup>1</sup> The total expenditures for several of the detailed sectors calculated this way exceeded the total sector size from the output data.<sup>2</sup> As a result, the shares of all input expenditures of the detailed sectors were reduced so as to equal the total expenditure necessary to be consistent with the IO data. Residual amounts were added to the OAC sector, as were inputs of several classes of expenditures that did not match with the input categories detailed in the budget data. Finally, as mentioned a number of inputs were allocated solely to OAC.

Each resulting sector exhibits zero profits, and the total input demand by all sectors adds to the initial value from the L-level input of the AGR sector.

Appendix table A.4 reports the resulting disaggregated L-level agrifood input data across the input goods.

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<sup>1</sup>In some cases, generic expenses were allocated proportional to net operating expenses. This is an attempt to allocate the various margins in proportion to the sector size.

<sup>2</sup>Detailed sectors are all the farm sectors except the residual OAC (Other Animal and Crop) sector.

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# Appendix A

## Reference Tables

Table A.1: Output Disaggregation

	MLK	CHK	TUR	EGG	OAC
Cattle and calves	263.8	11.5	1.9	4.2	7505.6
Hogs	23.0	20.7	3.5	7.6	3788.3
Poultry	6.1	1102.3	185.4	402.9	64.4
Other live animals	2.6	0.9	0.1	0.3	381.1
Wheat, unmilled	88.6	21.2	3.6	7.7	3095.9
Corn, barley, oats and other g	79.1	18.9	3.2	6.9	2765.8
Fluid milk, unprocessed	4043.3	12.8	2.1	4.7	90.2
Eggs in the shell	1.9	344.9	58.0	126.1	20.1
Honey and beeswax	0.6	0.2	0.0	0.1	83.1
Fresh fruit, excluding tropical	1.7	1.6	0.3	0.6	546.9
Vegetables, fresh or chilled	9.6	3.9	0.7	1.4	2919.4
Hay and straw	126.6	16.3	2.7	5.9	2225.4
Seeds, excluding oil seeds	2.9	0.1	0.0	0.0	54.9
Nursery stock, flowers, etc	1.3	1.2	0.2	0.4	1739.9
Canola, soybeans and other	55.7	13.3	2.2	4.9	1946.9
Services incidental to ag	126.0	19.6	3.3	7.2	1305.0
Animal byproducts for indust	1.5	0.5	0.1	0.2	214.8
Maple sugar, syrup, other syrup	7.5	0.2	0.0	0.1	140.2
Poultry, fresh, chilled, frozen	0.2	44.4	7.5	16.2	2.6
Custom work, meat and food	0.2	0.1	0.0	0.0	4.6
Other services to business	0.1	0.0	0.0	0.0	0.9
Rental, video, recreational eq	0.1	0.0	0.0	0.0	1.9

	MLK	CHK	TUR	EGG	OAC
Outputs 100% Allocated to OAC					
Raw tobacco	0.0	0.0	0.0	0.0	257.0
Raw wool and mink skins	0.0	0.0	0.0	0.0	46.5
Fuelwood and other crude wood	0.0	0.0	0.0	0.0	202.0
Fish and seafood,fresh,chilled	0.0	0.0	0.0	0.0	524.0
Beef,pork,other meat	0.0	0.0	0.0	0.0	233.0
Feeds from animal byproducts	0.0	0.0	0.0	0.0	2.0
Raw animal hides and skins	0.0	0.0	0.0	0.0	2.0
Fish and seafood products	0.0	0.0	0.0	0.0	241.0
Fertilizers	0.0	0.0	0.0	0.0	378.0
Crude vegetable materials	0.0	0.0	0.0	0.0	60.0
Truck transportation	0.0	0.0	0.0	0.0	287.0
Other rent	0.0	0.0	0.0	0.0	19.0
Software development, computer	0.0	0.0	0.0	0.0	2.0

Table A.2: Farm Revenue Data (\$M)

	CROP	BEEF	DAIRY	HOGS	POULT	OANL
NUMF	100240	62630	14940	5400	4390	11605
GOSR	68881	7275	14454	26234	18054	3952
POTR	8067	0	105	0	0	0
FRUR	7020	53	145	100	710	40
VEGR	7913	30	249	623	753	82
TOBR	1755	0	0	0	0	0
GNFR	25057	27	123	139	606	0
FCRR	4571	2058	2328	2171	1562	1082
OCRR	2429	92	898	335	156	87
CATR	5885	118329	19060	7340	4344	5388
HOGR	369	509	1846	822247	8685	3645
PEGR	230	204	788	10312	748621	2899
DPRR	323	252	306106	5077	5042	2275
OLPR	219	414	321	712	552	55912
CWMR	8232	13737	5901	16564	14253	12667
RENR	3110	3036	1922	4647	7089	1809
MISR	8108	3576	7073	5584	5741	2383

Table A.3: Mapping between L-level Outputs and Budget Data

Wheat	Total grains and oilseeds
Corn, barley, oats and other grain	Total grains and oilseeds
Canola, soybeans and other oilseeds	Total grains and oilseeds
Fresh fruit	Fruits
Vegetables	Vegetables
Raw tobacco	Tobacco
Nursery stock, flowers, etc.	Greenhouse, nursery and floriculture products
Hay and straw	Forage crops (including seeds)
Seeds excluding oilseeds	Other crops
Maple sugar, syrup and other syrup	Other crops
Cattle and calves	Cattle
Hogs	Hogs
Poultry	Poultry and eggs
Eggs in the shell	Poultry and eggs
Poultry fresh, chilled, frozen	Poultry and eggs
Fluid milk	Dairy products and subsidies
Other live animals	Other livestock and products
Honey and beeswax	Other livestock and products
Raw wool and mink skins	Other livestock and products
Feeds from animal byproducts	Other livestock and products
Raw hides and skins	Other livestock and products
Animal byproducts for industrial use	Other livestock and products
Custom work, meat and food	Custom work and machine rental
Rental video and rec. equip, other	Custom work and machine rental
Services incidental to agriculture and forestry	Miscellaneous revenues
Other services to business and persons	Miscellaneous revenues

Table A.4: Input Disaggregation

	MLK	CHK	TUR	EGG	OAC
Eggs in the shell	0.0	0.3	0.1	0.1	0.4
Cattle and calves	33.6	1.1	0.2	0.4	1316.8
Hogs	0.1	0.2	0.0	0.1	41.6
Poultry	0.7	141.1	23.7	51.6	172.8
Wheat, unmilled	31.8	22.9	3.8	8.4	243.2
Corn, barley, oats and other g	152.1	109.3	18.4	40.0	1163.3

	MLK	CHK	TUR	EGG	OAC
Vegetables, fresh or chilled	35.0	25.1	4.2	9.2	267.5
Hay and straw	219.9	158.0	26.6	57.8	1681.7
Seeds, excluding oil seeds	2.5	0.2	0.0	0.1	48.1
Canola, soybeans and other oil	16.6	11.9	2.0	4.4	127.1
Services incidental to agricul	556.5	35.4	6.0	13.0	1976.1
Natural gas, excluding liquefi	12.5	6.7	1.1	2.4	149.2
Feeds from animal byproducts	0.4	0.3	0.0	0.1	3.1
Custom work, meat and food	2.8	0.8	0.1	0.3	33.0
Feed supplements and premixes	47.1	33.8	5.7	12.4	360.0
Complete feeds	323.0	232.2	39.1	84.9	2470.8
Feeds from grain byproducts	5.6	4.1	0.7	1.5	43.1
Feeds from vegetable byproduct	2.6	1.8	0.3	0.7	19.6
Pet feeds	2.3	1.6	0.3	0.6	17.3
Oil-cake feeds	42.5	30.5	5.1	11.2	324.7
Tires and tubes, excluding pas	5.2	0.7	0.1	0.2	76.8
Rope and twine	7.7	2.0	0.3	0.7	54.3
Iron and steel wire and cable	11.6	3.0	0.5	1.1	81.8
Iron and steel wire fencing an	0.9	0.2	0.0	0.1	6.7
Bulldozers, farm and garden tr	8.1	1.0	0.2	0.4	120.4
Other agricultural machinery	14.8	1.9	0.3	0.7	218.4
Lime	1.0	0.1	0.0	0.0	24.9
Motor gasoline	22.2	2.8	0.5	1.0	328.5
Diesel and fuel oil, aviation	37.4	4.8	0.8	1.7	553.3
Lubricating oils and greases	3.9	0.5	0.1	0.2	57.4
Liquid petroleum gases, includ	6.9	0.9	0.1	0.3	101.8
Fertilizers	80.0	5.5	0.9	2.0	1904.6
Pharmaceuticals	15.5	1.0	0.2	0.4	55.0
Chlorine	0.1	0.0	0.0	0.0	1.2
Ammonia	3.9	0.3	0.0	0.1	92.7
Methyl alcohol	0.0	0.0	0.0	0.0	0.1
Antifreezing preparations	0.5	0.1	0.0	0.0	7.4
Additives and automobile chemi	0.1	0.0	0.0	0.0	0.9
Insecticides and herbicides	22.8	2.7	0.5	1.0	995.1
Repair construction	102.6	26.4	4.4	9.7	724.8
Water transport	0.2	0.0	0.0	0.0	0.8
Truck transportation	56.7	12.3	2.1	4.5	270.4
Pipeline transportation	4.3	2.3	0.4	0.8	51.2

	MLK	CHK	TUR	EGG	OAC
Storage and warehousing	5.2	1.1	0.2	0.4	25.0
Telephone and other telecommun	17.7	9.4	1.6	3.4	209.9
Electric power	47.1	25.2	4.2	9.2	560.2
Gas distribution	2.4	1.3	0.2	0.5	28.6
Water and other utilities	1.5	0.8	0.1	0.3	18.2
Wholesaling margins	257.6	55.9	9.4	20.4	1228.7
Repair service for machinery a	24.1	3.2	0.5	1.2	240.9
Retailing margins and service	19.2	4.2	0.7	1.5	91.4
Imputed service charge, banks	77.7	16.8	2.8	6.2	370.5
Other financial intermediary a	73.9	16.0	2.7	5.9	352.5
Insurance	40.7	7.7	1.3	2.8	307.5
Other rent	2.6	0.8	0.1	0.3	49.1
Engineering, scientific, accou	115.9	25.1	4.2	9.2	552.6
Other services to business and	5.7	1.2	0.2	0.5	27.4
Rental, video and recreational	15.3	4.7	0.8	1.7	284.5
Spare parts and maintenance su	114.9	24.9	4.2	9.1	547.9
Transportation margins	66.0	14.3	2.4	5.2	315.0
Sales of other government serv	15.1	3.3	0.5	1.2	71.9
Indirect taxes on products	71.0	15.4	2.6	5.6	338.4
Subsidies on products	-258.4	-18.6	-3.1	-6.8	-3105.1
Subsidies on production	-9.4	-0.7	-0.1	-0.2	-113.5
Indirect taxes on production	190.0	41.2	6.9	15.1	905.9
Wages and salaries	297.0	112.4	18.9	41.1	2871.5
Supplementary labour income	15.6	5.9	1.0	2.2	151.3
Mixed income	274.9	59.6	10.0	21.8	1310.8
Other operating surplus	1465.4	317.7	53.4	116.1	6988.4
Goods 100% Allocated to OAC					
Logs, bolts and poles	0.0	0.0	0.0	0.0	27.0
Fish and seafood, fresh, chill	0.0	0.0	0.0	0.0	132.0
Bauxite and alumina	0.0	0.0	0.0	0.0	0.1
Peat	0.0	0.0	0.0	0.0	11.0
Animal byproducts for industri	0.0	0.0	0.0	0.0	0.1
Nuts	0.0	0.0	0.0	0.0	0.1
Other textile products	0.0	0.0	0.0	0.0	16.0
Wood containers	0.0	0.0	0.0	0.0	31.0
Office furniture	0.0	0.0	0.0	0.0	0.1
Paper bags and containers, pla	0.0	0.0	0.0	0.0	55.0

	MLK	CHK	TUR	EGG	OAC
Steel railway construction mat	0.0	0.0	0.0	0.0	0.1
Computers and office equipment	0.0	0.0	0.0	0.0	0.1
Ship repairs	0.0	0.0	0.0	0.0	0.1
Bricks and other clay building	0.0	0.0	0.0	0.0	0.1
Aircraft and nautical navigati	0.0	0.0	0.0	0.0	0.1
Air transportation	0.0	0.0	0.0	0.0	30.0
Meals	0.0	0.0	0.0	0.0	1.0
Services to buildings and dwel	0.0	0.0	0.0	0.0	1.0
Software development, computer	0.0	0.0	0.0	0.0	5.0
Membership organization dues (	0.0	0.0	0.0	0.0	6.0
Office supplies	0.0	0.0	0.0	0.0	2.0
Travelling and entertainment	0.0	0.0	0.0	0.0	15.0
Advertising and promotion	0.0	0.0	0.0	0.0	1.0

Table A.5: Farm Expenditure Data (\$M)

	HOGS	CROP	BEEF	DAIRY	POULT	OANL
NUMF	5400	100240	62630	14940	4390	11605
PPMT	221	2567	1267	539	70	116
FERT	48	1899	253	141	17	19
PEST	28	1302	114	50	11	10
SEED	38	1281	107	112	16	11
CTL	18	186	4099	166	9	31
HOGS	1019	12	7	4	12	9
PEGG	11	5	3	2	721	6
OLP	0	9	12	1	1	186
FEED	1676	149	1518	819	1059	177
VET	130	36	177	196	22	54
FUEL	64	1071	493	175	40	54
REPR	98	1095	480	274	66	62
WAGE	365	2123	355	502	342	133
RENT	100	751	196	89	49	23
INSU	61	319	127	115	39	26
UTIL	120	612	171	128	123	32
CWRK	238	1068	599	265	133	97
BREP	69	234	129	109	50	31
NOI	544	2574	710	1415	552	42

Table A.6: Mapping between L-level Goods and Budget Data

Eggs in the shell	poultry and egg purchases
Cattle and calves	cattle purchases
Hogs	hog purchases
Poultry	poultry and egg purchases
Other live animals	other livestock purchases
Wheat, unmilled	feed, supplements, straw and b
Corn, barley, oats and other g	feed, supplements, straw and b
Fresh fruit, excluding tropica	feed, supplements, straw and b
Vegetables, fresh or chilled	feed, supplements, straw and b
Hay and straw	feed, supplements, straw and b
Seeds, excluding oil seeds	seed and plants
Nursery stock, flowers, etcete	seed and plants
Canola, soybeans and other oil	feed, supplements, straw and b
Services incidental to agricul	veterinary fees, medicine and
Natural gas, excluding liquefi	utilities
Feeds from animal byproducts	feed, supplements, straw and b
Custom work, meat and food	custom work and machine rental
Prepared meals, mineral water,	feed, supplements, straw and b
Feed supplements and premixes	feed, supplements, straw and b
Complete feeds	feed, supplements, straw and b
Feeds from grain byproducts	feed, supplements, straw and b
Feeds from vegetable byproduct	feed, supplements, straw and b
Pet feeds	feed, supplements, straw and b
Oil-cake feeds	feed, supplements, straw and b
Tires and tubes, excluding pas	net fuel expenses, machinery,
Rope and twine	building and fence repairs
Iron and steel wire and cable	building and fence repairs
Iron and steel wire fencing an	building and fence repairs
Bulldozers, farm and garden tr	net fuel expenses, machinery,
Other agricultural machinery	net fuel expenses, machinery,
Lime	fertilizer and lime
Motor gasoline	net fuel expenses, machinery,
Diesel and fuel oil, aviation	net fuel expenses, machinery,
Lubricating oils and greases	net fuel expenses, machinery,
Liquid petroleum gases, includ	net fuel expenses, machinery,
Fertilizers	fertilizer and lime

Pharmaceuticals	veterinary fees, medicine and
Chlorine	fertilizer and lime
Ammonia	fertilizer and lime
Methyl alcohol	net fuel expenses, machinery,
Antifreezing preparations	net fuel expenses, machinery,
Additives and automobile chemi	net fuel expenses, machinery,
Insecticides and herbicides	pesticides
Repair construction	building and fence repairs
Water transport	net operating income
Truck transportation	net operating income
Pipeline transportation	utilities
Storage and warehousing	net operating income
Telephone and other telecommun	utilities
Electric power	utilities
Gas distribution	utilities
Water and other utilities	utilities
Wholesaling margins	net operating income
Repair service for machinery a	repairs, licenses and insuranc
Retailing margins and service	net operating income
Imputed service charge, banks	net operating income
Other financial intermediary a	net operating income
Insurance	insurance
Gross imputed rent	rent
Other rent	rent
Engineering, scientific, accou	net operating income
Other services to business and	net operating income
Rental of automobiles and truc	rent
Rental, video and recreational	rent
Spare parts and maintenance su	net operating income
Transportation margins	net operating income
Sales of other government serv	net operating income
Indirect taxes on products	net operating income
Subsidies on products	program payments and insurance
Subsidies on production	program payments and insurance
Indirect taxes on production	net operating income
Wages and salaries	salaries
Supplementary labour income	salaries

Mixed income	net operating income
Other operating surplus	net operating income