

Dairy Cattle Symposium

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The ABC's of Organic Production

Linda LABRECQUE, d.t.a., farmer
Ferme Desgéo and farm management technician
Groupe conseil agricole de Lotbinière-Nord
Sainte-Croix-de-Lotbinière

Presentation prepared with the collaboration of:

Marie-Claude BOURGALT, P.Ag., management advisor
Groupe conseil agricole Lotbinière-Nord
Sonia GOSSELIN, d.t.a., extension agent, Valacta



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The ABC's of Organic Production

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Over the past few years, organic farming has been increasing throughout the world. Initially, organic farming was the favour of hippy groups. It has rapidly evolved and it is now a type of farming which holds its rightful place in the world and it is recognised as a forward-looking approach and suitable for all types of agricultural productions. Some of the factors contributing to this expansion are consumer demands for organically produced products, reconsidering the soundness of industrial production systems, and concerns regarding the environment.

The appeal of producing an added-value product, of decreasing production costs and of farm self-sufficiency are also avenues which have lead to organic farming. We mustn't disregard the philosophical beliefs that often accompany this type of farming, as they often weigh heavily in the decision process when converting to organic farming. Organic farming seeks to support human beings and their environment. **It aims to create a global ecosystem that works to maintain a balance between the soil, plants, animals and humans.**

DESCRIPTION OF ORGANIC DAIRY PRODUCTION WORLDWIDE

Throughout the world, the demand for organic products is growing steadily. The number of farms converting to organic farming is also growing. Most European countries recognise organic farming as being less polluting, more sustainable and more ecological. For these reasons, in many countries, farmers who choose this type of production receive a variety of economic incentives such as subsidies per hectare, assistance programs for the transition process, rural development and agri-environmental aid, support for processing and marketing, initiatives to inform producers, consumer education and infrastructure support.

Governments have established various programmes to help develop the organic sector because of its many advantages for the benefit of society in general.

The growth and development of organic farming are supported by different research centres and universities. Governments, universities and the private sector have geared their research to organic farming, as it insures the long-term sustainability of resources. Research done in these institutions serves organic farming but also has some influence on conventional agriculture.

Organic Hectares Worldwide

Country 2005	Organic Area (ha)	Organic Area (%)
Austria	360,972	14.16
Belgium	22,996	1.65
Czech Republic	254,982	5.97
Denmark	145,636	5.62
Finland	147,587	6.52
France	560,838	2.03
Germany	807,406	4.74
Great Britain	619,852	3.9
Greece	288,255	3.15
Italy	1,067,102	8.4
Latvia	118,612	4.78
Lithuania	69,430	2.49
Luxembourg	3,243	2.51
Slovakia	92,191	4.91
Slovenia	23,499	4.84
Sweden	200,010	6.27
Netherlands	48,765	2.49
Norway	43,033	4.14
Switzerland	117,117	10.94
Poland	167,740	1.03
Portugal	233,458	6.34
Spain	807,569	3.2
Canada	578,874	0.86
Australia	11,800,000	2.68
New Zealand	45,000	0.26
United States	1,620,350	0.5

Organic Dairy Cows Worldwide

Country 2005	Number of Organic Dairy Cows	(%)
Austria	86,896	16.1
Belgium	7,993	1.5
Czech Republic	2,865	0.7
Denmark	53,115	9.5
Finland	5,052	1.6
France	66,123	1.8
Germany	101,000	2.4
Great Britain	83,252	4.0
Greece	480	0.3
Italy	38,284	2.1
Latvia	3,048	1.6
Lithuania	3,447	0.8
Luxembourg	243	0.6
Slovakia	1,550	0.8
Slovenia	1,004	0.7
Sweden	22,321	5.6
Netherlands	305	< 1%

SOME RESEARCH CENTRES

The Research Institute of Organic Agriculture (FiBL) in Switzerland, Germany and Austria: 125 researchers for over 34 years. Research in all areas of organic farming, such as vegetables, fruits, milk, vineyards, poultry, meat, animal health, wine making, certification and product quality. They have a budget of 14.5 million Swiss francs, financed at 36% by the government, 19% by public funds and 45% by private funding such as processors, publishers, distributors and grocery stores.

The agronomic research stations Agroscope in Switzerland: organic meat and dairy production, processing of products (cheese, meat, and delicatessen products), production systems, safety and product quality, local agriculture, land use and "terroir" They collaborate with FiBL.

DARCOF (Danish Research Centre for Organic Farming), Denmark: coordinates research in organic farming in 15 institutions with 140 researchers since 1996. Denmark assigns 4 to 8% of its total budget to research and development, which goes directly to DARCOF; this represented 30 million Euros from 2000 to 2005.

Faculty of Organic Agriculture of the Kassel University in Germany. Since 1996, specialized in organic agriculture with 23 professors who teach various aspects of organic farming: 600 to 700 students per year. In 2004, the federal German government launched a vast research and development programme in organic farming with a budget of 35 million.

Louis Bolk Institute, Netherlands: research foundation in organic farming in various areas, employing about fifty people, founded in 1976.

COR (Colloquium of Organic Researchers), United Kingdom: coordinates research and directs the actions in organic farming. They work in collaboration with the Organic Centre in Wales of the University of Aberystwyth and have an annual budget of 2.1 million.

In France, there are several organisations and institutions that work in the area of organic farming. Each French department has its own specialized technical centre in organic farming supervised by the Institut Technique de l'agriculture biologique (ITAB).

In 2006, the United States announced a budget of 4.6 million dollars (US) for research, services and development of organic farming. In New Hampshire, an organic dairy research farm was established in 2007 and is associated with the University of New Hampshire. A dozen states offer training programmes in organic farming at their universities.

In Canada, the Alfred Campus at Guelph University has a dairy farm which eventually will become a research centre in organic dairy production. The dairy farm will be certified in 2008.

In Quebec, through the UPA-MAPAQ network, financial assistance is provided to producers for specialized consulting services (organic milk associations, agri-environmental clubs, extension services, etc.). There is also a provincial programme of 1 million annually to support organic farming initiatives (technology transfer, training, research and projects).

Valacta (Dairy Production Centre of Expertise) and the Centre d'insémination artificielle du Québec (CIAQ) (Quebec Artificial Insemination Centre) offer specialized services in organic dairy production (consulting services and sire selection). Suppliers of minerals, grains, feeds and seeds are increasingly meeting the specific needs of organic producers.

Throughout the world, the organic milk premium paid to producers varies between 20 and 25% higher than the price of conventional milk of that country.

THE SITUATION IN QUEBEC

All the organic milk in Quebec is marketed the same way as conventional milk, that is to say organic milk sold to the organic milk processing plants use the Fédération des producteurs de lait du Québec (Quebec Dairy Producers Federation) network. Milk sales and the premium according to the class paid by the processors are pooled. The premium is divided and paid per hectolitre to all organic producers who are certified and who are part of the milk pick-up network.

There can be a waiting list (or a delay between being certified as an organic dairy producer and the organic milk being collected as organic).

The additional transportation costs required for organic milk are carried by the organic milk producers. The additional transportation costs are deducted from the premium before it is paid out, this represents about \$2.25 to \$2.85 per hectolitre.

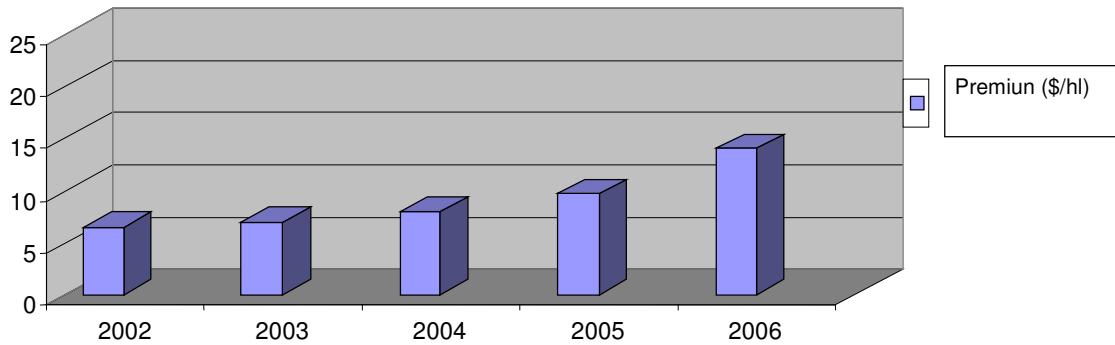
The milk is hauled in trucks that carry only organic milk or in a section of the tank truck reserved for organic milk.

Distribution by region of organic dairy producers (as at December 31, 2006)



Farmers' union	Number of producers	%
Eastern Townships	2	3 %
Côte-du-sud	7	9 %
Gaspésie-Magdalene Islands	0	0 %
Lanaudière	0	0 %
Mauricie	4	5 %
Laurentides	1	1 %
Centre-du-Québec	11	15 %
Abitibi-Témiscamingue	0	0 %
Quebec City	14	19 %
Beauce	4	5 %
Bas-St-Laurent	22	30 %
Saguenay-Lac St-Jean	7	9 %
St-Hyacinthe	2	3 %
St-Jean-Valleyfield	1	1 %
TOTAL	75	100 %

Progress of premium paid to producers, net of transportation costs

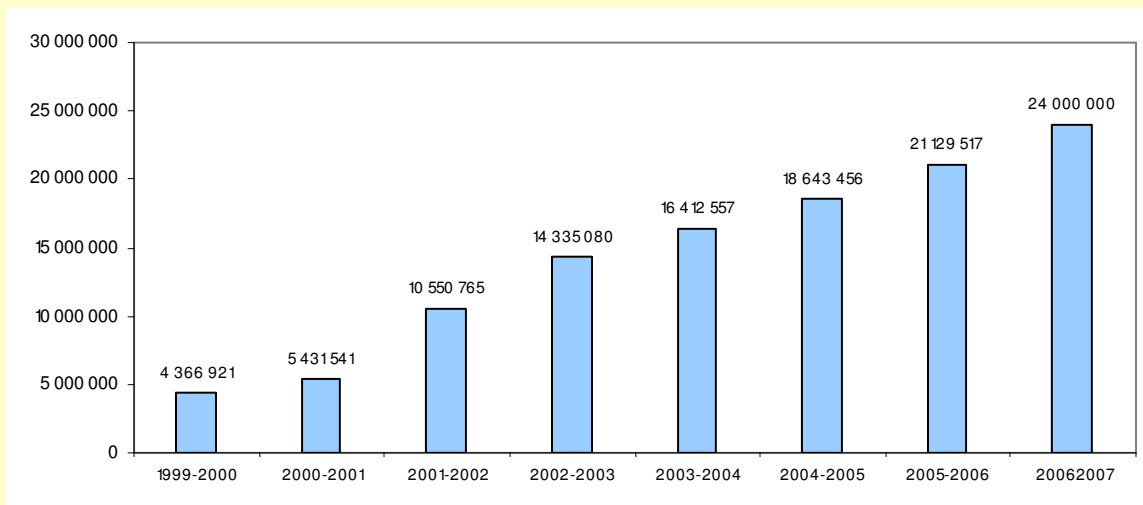


In 2007, the forecasted premium is \$17 per hectolitre, transportation costs already paid

Premium paid by processors according to the class, since February 2007:

- Class 1 and 2 = \$23.75/hl
- Class 3 and 4 = \$15.00/hl

Increase in production (in litres)



Quebec is the largest producer of organic milk in Canada. In 2006, 68 certified dairy farms produced 52% of the total national production. However, the organic producers are but a drop in the Quebec milk bucket, as they account for as little as 0.65% of the total milk produced in Quebec.

In Canada, there are 40.8 millions litres of organic milk produced; this represents less than 1% of the total milk produced in Canada.

In 2006, there were 118 organic dairy farms. Ontario produces 28% of the volume of organic milk with 44 farms, and British Columbia has 20% of the volume with 11 farms. There are no organic dairy farms in the Maritimes and in western Canada. Overall, all the Canadian provinces are facing a growing demand for organic milk. In Canada, the demand for organic milk exceeds the supply.

On the other hand, several European countries are currently overproducing organic milk.

In North America, the demand for organic dairy products remains stronger than the supply, and there are no signs of letting up.

Organic milk processing plants



319	Kerry (Québec) Inc.	Ste-Claire
372	Laiterie Lamothe & Frères Itée	Drummondville
410	Ferme Raymond Alary & Fils (1981) inc	Ste-Sophie
428	F.X. Pichet inc.	Champlain
450	Les produits de marque Liberté inc.	Brossard
455	Fromagerie Clément inc.	St-Damase
465	Danone inc.	Boucherville
468	Fromages La Chaudière inc.	Lac Mégantic
473	Au Gré des Champs inc.	St-Jean-sur-Richelieu
515	Fromagerie Ferme des Chutes	St-Félicien
525	Fromagerie de l'Alpage	Châteauguay
532	Fromagerie l'ancêtre inc.	Bécancour
625	La Moutonnière inc.	Chester Est
668	Laiterie Tournevent	Drummondville

In Quebec we produce and market organic milk in 1 and 2-litre cartons, different types of organic cheeses from raw and pasteurized milk, organic butter, table cream, sour cream, yogurt and kefir. In 2006, 30.6% of organic milk was sold fresh, 36.2% as yogurt, 30.3% as cheese and 2.8% as butter.

Other organic dairy products are available, although they are not made in Quebec. These products come from Denmark, Ontario or British Columbia (cheese, yogurt, ice cream and milk).

CERTIFICATION STANDARDS

In Quebec, certification standards are regulated by the Conseil des appellations agroalimentaires du Québec (CAAQ) which is the only recognised provincial agency responsible for managing and protecting controlled designations in Quebec.

In Quebec, the word "organic" is a controlled designation and is tied to the certification. In other words, this word cannot be used unless there is a certification by an agency recognised by the CAAQ. There are many certification bodies that are accredited in Quebec. These certification agencies must minimally adhere to the standards issued by the CAAQ. These can however be stricter.

The CAAQ was founded in 1998. Since then, Quebec has abided by the international standards of certification.

Quebec is the only Canadian province that has a regulatory structure which abides by the international standards in the field of organic certification. Canada must comply with these standards to continue exporting organic products.

Each certification agency has its own requirements and specifications with some small additions and distinctiveness.

CERTIFICATIONS AGENCIES

Organic foods in Quebec can carry one of the following eight logos, which identify the six certification organisations recognised by the Conseil des appellations agroalimentaires du Québec.



GARANTIEBIO – ECOCERT
Certification brand: GARANTIEBIO - ECOCERT



INTERNATIONAL CERTIFICATION SERVICES
Certification brand: FARM VERIFIED ORGANIC, FVO



OCIA – INTERNATIONAL
Certification brand: OCIA



OCPP/PRO-CERT CNADA
Certification brand: OC/PRO AND OCPP/PRO-CERT CANADA



ORGANISME DE CERTIFICATION QUÉBEC VRAI
Certification Brand; QUÉBEC VRAI and OCQV



QAI inc.
Certification brand: QUALITY ASSURANCE INTERNATIONAL and QAI inc.

Organic foods imported from outside of Quebec can be certified by one of the many international certification agencies recognised by the CAAQ for products imported from outside Quebec.

To request a certification, producers must contact a recognised agency. An inspector will come to the farm and inspect the installations, the crops and the animals. The inspector will ask to see record logs, books, invoices and other relevant documents. A certification visit usually takes a half-day.

This visit must be renewed each year for the farm to maintain a valid certification. The cost is about \$1,200 per year for an organic dairy farm. The certification agency can also make unplanned visits and/or verifications if a complaint has been lodged.

The producer can also ask for visits in the case of a request for exemption or for a specific follow-up.

Certification standards for crop production

- Three years of production abiding by organic standards before receiving accreditation
- Use of untreated seeds and no GMOs
- Mandatory crop rotation

- Authorized fertilization: manure, liquid manure, compost from the farm or other non-organic farm
- Record books for fields, fertilization, silos, machinery and equipment used
- Mineral fertilizer used in their allowed natural state (all types of lime)
- Use of slurries from paper mills, septic tanks and waste management plants is not allowed
- All manufactured pesticides are prohibited, including Round-up
- Thorough cleaning of all rented or contracted equipment and machinery before use
- Buffer zone: adequate physical barrier (shelterbelt, ditch, hedge, road, riparian strip). Otherwise when there is a risk of contamination by neighbouring spraying of prohibited products, a buffer strip of 8 metres between the organic field and the non-organic field must be established and the crop collected must be excluded from the organic harvest.

Organic livestock production

- The farm fields must be certified organic before contemplating the transition of the herd and dairy production
- Application of organic standards for one full year before certification can be given
- Herds must be allowed outdoors with sufficient pasture to ensure a portion of the dairy cows' ration and avoid overgrazing and soil degradation
- Mutilation is forbidden, with the exception of dehorning which is permitted
- Feed must be 100% certified organic
- A maximum of 40% of concentrate in the ration on a dry matter basis (organic grains, organic meal and organic soy)
- A minimum of 60% of forages in the ration on a dry matter basis (hay and corn silage, hay and pasture); 25% of the forage should be dry hay
- Minerals approved by the certification agency
- Records on the health of the herd and on the health of individual animals
- Forages must be free of chemical additives; the only preservatives permitted are salt and bacteria
- Heifer calves must consume organic milk for three months
- Minerals, vitamins, salt, plant extracts and other products from natural sources are permitted
- Reproduction hormones are prohibited, as are embryo transplants
- Artificial insemination is allowed
- Antibiotics are permitted as a last resort, and when appropriate, exclusion of the milk for fourteen days or twice the required period. This milk must not be used for heifers
- Vaccination permitted
- Animals under active and regular veterinarian care should be removed from the herd
- Somatic cell count below 400,000
- Maintenance of milking system: if non-organic products are used then the equipment must be rinsed twice
- Replacement heifers are subjected to the same standards as the dairy cows
- Replacement animals should be certified organic or be within a year of becoming so

- Purchase of non-organic farm sire is allowed
- Elimination or control of external pests (rodents, flies, etc.) permitted but without the use of chemical pesticides.

TECHNICAL AND ECONOMIC ANALYSIS

Marie-Claude Bourgault, P.Ag., management advisor
GCA Lotbinière-Nord

The findings presented here are the results of a study done on a group of certified organic farms of which a majority belong to an agriculture management union. The study collected data from 23 farms from all over the province of Quebec, the majority of which are in the Lotbinière region and, in second place, in the Bas-St-Laurent-Gaspésie region. It should be noted that within this group some farms were not specialized in dairy production, that is to say that they have economic activities besides milk which have a significant impact on the total farm business income. This situation does not affect the cost of producing milk.

For the purpose of comparison, a group of conventional farms was used. This group originates from the 2006 study findings of the agriculture management union from the Chaudière-Appalaches region and has 158 dairy farms (at least 80% of their gross revenues comes from dairy)

The Table below provides a description of these groups:

Table 1. Group Descriptions

Parameters	Organic Group	Conventional Group
Number of farms	23	158
Average total revenue	\$468,000	\$363,000
Gross revenue from dairy (%)	81.8	91.3
Average quota in 2006 (kg)	42.9	46.2
Area in crop production (ha)	166	88
Average WU ⁶ by farm	2.96	2.18

Overall Results

The overall results take into account the different farm sectors such as dairy, crop production, cheese making, etc. The comparison of the results of the organic groups with the conventional groups must be broken down by sector to obtain a clearer picture. This cautionary note notwithstanding, the following Table illustrates the general picture of the farms studied.

Table 2. Overall Results of the Farm Businesses

Parameters	Organic Group	Conventional Group
Farm income (including amortisation, salaries, but not the owners' withdrawals)	24% ¹	22%
Total costs (before salaries, int. MLT, amort., capital gain tax)	47% ²	51%
Salaries, withdrawal and income taxes	21% ³	18%
Payments (capital and interests)	24% ⁴	25
Balance	8% ⁵	6%
Salaries and withdrawal/WU ⁶	\$31,500	\$25,500
SI ⁷ /WU	\$61,000	\$51,206

¹ As a proportion of revenues

² Ibid

³ Ibid

⁴ Ibid

⁵ Ibid

⁶ Work unit

⁷ Standardized Income

The operating profits from organic dairy farms are slightly higher than the profits of the mean group of conventional farms. There is a 4% decrease in costs to produce the same income dollar for certified farms. It should be noted that with these farms the salary, withdrawal and tax component is 3% higher for the same level of income. This difference has a twofold explanation; there are more WUs for each revenue dollar at organic farms and compensation per WU is higher by \$6,000.

The analysis demonstrated that by standardizing the salaries and the debt load (SI/WU) the profitability per WU is higher for organic farms compared to the average group. However, the lead group which emerged from the Chaudière-Appalaches group analysis shows a performance of the SI/WU above the organic farms by about \$70,000. It is important to remember that 6 farms in the organic group have less than 80% of their farm income coming from the dairy sector. Therefore, judgement is called for when using these results.

To more accurately measure the impact of certification on the business results, it is preferable to analyse each sector of activity separately. Let's examine more closely the analysis of the dairy and the crop production sector.

Dairy Results

The analysis of the dairy sector is based on a segregated financial analysis (dairy) which isolates the dairy management costs and allows this sector to undergo a cost benefit analysis separately from the whole. Milk income and variable direct costs are segregated. To this we attribute fixed costs that are distributed between the sectors according to the production units. In terms of feeding, everything that is consumed by the animals is regarded as being purchased at the standard cost. These costs represent the average cost

opportunity for the year of the cereal crop production. In fact, it represents the price the producer would have obtained had he sold his crops on the market rather than use them. Establishing organic milk production costs requires modifying the milk price with its premium as well as the cost of feeding as compared to conventional farms.

Table 3. Technical and Economic Criteria for the Dairy Sector

Parameters	Organic Group	Conventional group
Number of cows	65	53.9
Total milk produced (hectolitres)	4,325	4,382
Milk/cow (litres) ⁸	6,655	8,128
Milk/WU distributed (litres/WU)	146,000	201,000
Cost of standard concentrates (\$/t)	376	241
Quantity of concentrate (kg/cow)	2,223	3,108
Milk/kg of concentrate (litres/kg)	2.99	2.62
Production costs/cow (\$/cow)	70	86
Veterinary costs (\$/cow)	72	180

⁸ Milk average is based on total milk produced per average number of cows, taken from the Valacta (DHIA) report.

The organic farms that were studied showed a decreased productivity per WU compared to the conventional farms. However the study doesn't provide the reasons for this difference. Is there a genuine need for added labour when producing organic milk? Is it the owner's choice to have more farm labour? Are there more young farmers (farm successors) present on organic farms?

Dairy performance is less for organic cows than those in conventional management. In fact the average organic production per cow is 1.475 litres less for the farms in the study. Therefore more cows are needed to produce the same amount of milk. More cows mean more facilities to support the same level of performance.

Table 4. Cost of Milk Production

Parameters	Organic Group	Conventional Group
Average price received (\$/hl)	84.75	71.86
Variable costs (\$/hl)	38.85	33.17
Margin on variable costs (\$/hl)	45.90	38.69
Target price for milk at standard cost ⁹ (\$/hl)	73.78	62.23
Variation between target price (standard) and price received (\$/hl)	10.98	9.63

⁹ Represents milk production costs at standard cost, i.e., at the opportunity cost of feed rather than at the real costs of producing this feed.

The costs of producing organic milk are greater than \$3.63/hl with regard to the variable costs, which represents an additional cost of \$15,000 for the average farm in the organic group. The main difference relates to feeding. The animals consume more forage and concentrates are more expensive per tonne. However the veterinary, medication and reproductions costs are less for organic production. In terms of fixed costs, which include withdrawals, taxes, and return on assets the difference is \$6.42/hl between the two groups. Here again, it costs more for the organic producer; 57% of the difference is due to salaries, withdrawals and higher taxes.

The organic milk premium compensates for these differences in production costs. The average income earned in 2006 for each hectolitre of milk produced¹⁰ was about \$84.75/hl for the organic farms and \$71.86/hl for conventional farms. There is an important distinction to be made between shipped and produced milk, as the proportion of shipped milk/produced milk is less for organic producers (96%) compared to conventional producers (98%). The main difference is the quantity of milk given to the calves.

The difference between production costs at standard pricing and the average price received is higher for certified farms, and this difference represents more or less the profits obtained for each hectolitre of milk produced; \$1.63 per hectolitre separates the organic group from the average conventional farms. It should be noted that when analysing the lead group of farms in these same conventional farms, they have a profit of \$15.14/hl or \$4.16/hl over the organic group. In light of these findings, it is possible to obtain significant results with both types of production methods.

Crop Sector Results

By applying a segregated financial analysis of the crop production to the overall financial results of the dairy farm business, it is possible to evaluate the impact of the crop production sector. Everything that is consumed by the animals is considered to have been sold at standard prices. It should be noted that the price of hay and corn silage are the same for both organic and conventional farms because, at this time, there is no controlled market for certified hay. This analysis is very significant, especially for the organic production, and it validates the real contribution of the crop sector.

Table 5 Results Crop Sector

Parameters	Organic Group	Conventional Group
Crop area	166	88
Income (\$/ha)	966	880
Variables costs (\$/ha)	433	493
Fixed costs (\$/ha)	430	525
Assets, machinery, tractors (\$/ha)	1,109	1,678
Cost of utilisation of machinery (\$/ha) ¹¹	375	480
SI (\$/ha)	249	-18

¹¹ Includes fuel, maintenance and rental costs, work done by custom contractors and amortisation of machinery.

¹⁰ Milk produced includes milk shipped, given to calves, consumed by the owners and discarded.

Table 6. Crop Yields

Parameters	Organic Group	Conventional Group
Hay yields (t/ha)	5.8	6.1
Mixed cereal yields (t/ha)	2.3	2.4
Corn yield (t/ha)	5.0	7.3
Soy yield (t/ha)	2.0	2.9

Contrary to conventional farms, the crop sector on an organic farm contributes positively to the overall net income of the farm and this in spite of lower yields. However it is noteworthy that organic farms cultivate nearly double the acreage. This situation allows for economies of scale and optimization of machinery use. In fact, we can see that the capitalization per cultivated hectares is by far higher for conventional farms. It is important to note that the proportion of organic farms which use a CUMA (agricultural cooperative for machinery usage) is much larger than in the comparative conventional farm group. Although this aspect wasn't closely examined, it undoubtedly has an economic advantage for these farms.

Conclusion

Table 7. Profit Distribution of the Farms

Parameters	Organic Group		Conventional Group	
Total production profits	\$113,620	100%	\$78,682	100%
Profits from milk	\$97,657	86%	\$88,812	113%
Profits from crop	17,024	13%	(\$12,161)	-15%

The crop sector plays a significant role in the profitability of organic farms, contrary to conventional farms where the losses incurred in the crop sector must be compensated by the income from the dairy sector.

As yields and the average milk/cow production is less, this study demonstrates the need for organic farmers to obtain better prices for their products. Without this added value, the profitability of organic farms would be considerably behind that of conventional farming.

References

CAAQ Website

Syndicat des producteurs de lait biologique du Québec (Quebec Organic Dairy Farmers' Union)

Groupe gestion Lotbinière-Nord

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