

Agricultural Progress in Canada East/Quebec: Problems in Measuring Relative Productivity during the Grain-Dairy Transition Period.

J.I. LITTLE

Historians and econometricians who study the productivity of Quebec farmers in the nineteenth century incautiously ignore the difficulties inherent in comparing livestock-farming to grain-growing. Calorie-based tests are biased towards grain-farming, while cost-based analyses fail to consider the lower value of pasture land, thus underestimating the efficiency of livestock farmers. Either approach to farming might be reasonable in certain conditions. Transportation factors are particularly crucial in determining the integration of different agricultural zones into a market economy.

Les historiens et les économétriciens qui étudient la productivité des fermiers du Québec au XIX^e siècle ignorent imprudemment les difficultés du sujet lorsqu'ils comparent l'élevage du bétail à la culture des grains. Les textes de valeur calorique sont biaisés en faveur des grains, car les analyses de coût de base négligent de considérer la faible valeur des terres de pâture, et donc sous-estiment le rendement des éleveurs de bétail. L'une ou l'autre façon d'aborder le problème pourrait être raisonnable à certaines conditions. D'un autre côté, les facteurs de transport sont particulièrement importants dans la détermination de l'intégration des différentes zones agricoles à une économie de marché.

Where Quebec historians have generally been content to trace agricultural development through simple production statistics and crop yields, economists have been attempting to apply more accurate and/or more flexible techniques for comparative purposes. The work of R.M. McInnis and Frank Lewis comes under the "more accurate" category, for it attempts to account for inputs as well as outputs in order to draw a true picture of farming "efficiency." The term efficiency would seem to mean essentially profitability, and they painstakingly translate labour, land, crops, livestock and transportation into dollars and cents on the Montreal market.¹ Another common denominator, food production in calories, is utilized by John Isbister in an article published in 1977.² Isbister's work fits the "more flexible" category particularly well, because he is able to construct tables for the entire 1850-1970 period for Quebec and Ontario, whereas McInnis and Lewis have confined themselves thus far to 1851 in Canada East. Quebec historians cannot afford to ignore these innovative approaches because they promise to answer many of the fundamental issues we are grappling with: for example, the responsiveness of French-Canadian farmers to market forces, and the impact of the rural economy upon industrialization.³

1. See "The Efficiency of the French-Canadian Farmer in the Nineteenth Century," *Journal of Economic History*, 40, 3 (September 1980): 497-514; and "Agricultural Output and Efficiency in Lower Canada, 1851," Queen's University Discussion Paper No. 451 (November 1981).

2. "Agriculture, Balanced Growth, and Social Change in Central Canada since 1850: An Interpretation," *Economic Development and Cultural Change*, 5, 4 (July 1977): 673-697.

3. John McCALLUM draws a particularly strong link between the agricultural economy and urbanization in Upper and Lower Canada. See *Unequal Beginnings: Agriculture and Economic Development in Quebec and Ontario until 1870* (Toronto: University of Toronto Press, 1980).

The methodologies, not to mention the conclusions, of these economists have been controversial. Donald Kerr and William J. Smyth have published a comprehensive critique of Isbister's article, and Robert Armstrong has recently done the same for Lewis and McInnis,⁴ but a fundamental question still remains unanswered: how valid are the calculations presented by the articles in comparing two basically different types of farming, the raising of livestock and the growing of grain? Nineteenth-century farmers were certainly far less specialized than are those of today; nevertheless important regional distinctions became evident as soon as the so-called self-sufficient pioneer came to an end.

By 1851, according to Isbister's calculations, 33 percent of the food (calories) raised on the average Canada East farm came from meat and dairy products. The ratio for the Canada West farmer was only 24 percent. As the century progressed, a significant margin persisted: 1861 — 31 percent vs 17 percent, 1871 — 36 percent vs 27 percent, 1881 — 40 percent vs 24 percent, 1891 — 48 percent vs 33 percent, and 1901 — 56 percent vs 33 percent. As these figures suggest, Quebec's farmers were making important advances in the raising of livestock. However, meat production per average Quebec farm actually remained constant, whereas dairy production multiplied almost six-fold between 1851 and 1901, to equal finally that in Ontario. In the face of western competition in cereal grain and beef, specialization in butter and cheese was the only rational alternative for most eastern Canadian farmers. As Isbister himself points out, "in the last half of the nineteenth century, the dairy industry was responsible for the greater part of the increase in Ontario's farm productivity and for almost all of the increase in Quebec's."⁵ He adds that this would make Quebec farmers look comparatively quite progressive, except that "while in Ontario dairy products and meat were added to a substantial base of field crops, in Quebec dairy products substituted for a level of crop production which was inadequate for domestic needs." It is for this reason that Isbister concludes: "prior to the twentieth century, the French Canadian agricultural sector in Quebec generally achieved only a subsistence level of production; it was poor and commercially isolated."⁶

This conclusion, of course, ignores the great variety in size and commercial viability among Quebec farms since at least the turn of the nineteenth century. Many would produce a sizeable surplus, while others at the opposite end of the spectrum would simply provide a supplementary means of support to seasonal workers such as loggers and fishermen. In light of the Irish and West Highland Scots peasants' ability to survive and multiply rapidly (prior to the arrival of the blight) on potatoes, milk and very little else,⁷ it is difficult to believe that even the poorest Quebec farmer could not grow enough food for his family's dietary needs, leaving at least some of his butter and cheese as revenue for other purposes. (Isbister, in fact, fails to compensate for the incomplete census coverage of garden products.⁸) Furthermore, one cannot simply assume that the "average" Quebec farm family

4. Robert ARMSTRONG, "The Efficiency of Quebec Farmers in 1851," *Histoire sociale — Social History*, 17, no. 33 (Mai-May 1984): 149-63; D. KERR and W.J. SMYTH, "Agriculture, Balanced Growth, and Social Change in Central Canada since 1850: Some Comments Toward a More Complete Explanation," *Economic Development and Cultural Change*, 28, 3 (April 1980): 615-622.

5. ISBISTER, "The Efficiency," p. 683.

6. *Ibid.*, p. 673.

7. On the nutritional qualities of such a diet, see K.H. CONNELL, *The Population of Ireland 1750-1845* (Oxford: Clarendon Press, 1950). For a review of the literature on the impact of the potato on Irish and Scots demographic history, see Michael FLINN (ed.), *Scottish Population History from the 17th Century to the 1930s* (Cambridge: Cambridge University Press, 1977), pp. 421-38.

8. ISBISTER, "The Efficiency," p. 697.

had to depend for its daily food requirements on what its land actually grew. Why could farmers not exchange high value dairy products for relatively inexpensive flour to bake their bread? In fact, Isbister's choice of calories as the medium of measurement to compare the progress of Quebec and Ontario agriculture has serious limitations. As Fernand Braudel points out in his *Capitalism and Material Life*, "if the choices of an economy are determined solely by adding up calories, agriculture [i.e. crops] on a given area will always have the advantage over stock-raising; for better or worse, it feeds ten to twenty times as many people."⁹ If Quebec farmers had truly been indifferent to the marketplace and concerned solely with self-sufficiency, an increasing specialization in dairy products would have been a strange option to choose. The average Ontario farm may have been about "two-and-one half times as productive as Quebec farms"¹⁰ in terms of calories, but we need to know how much of this differential can be attributed to the fact that grain-growing was the most efficient option in terms of calories per acre. Food has never been sold by the calorie, so the profit margin between Quebec and Ontario farms would certainly have been less striking than Isbister's calculations might lead us to believe.

The methodology employed by McInnis and Lewis is much more satisfactory than that of Isbister when it comes to comparing the viability of livestock with crop-oriented agriculture. Though they do not examine Upper-Canadian agriculture in the articles under examination here, McInnis and Lewis do compare French- and English-speaking farmers in the Canada East of 1851, judging the relative efficiency of each group.¹¹ In doing so, however, they fall into essentially the same trap as Isbister, that of failing to appreciate sufficiently the basic contrast between raising cattle for meat or milk products on the one hand and growing cereal grain for the marketplace on the other. They attempt to cancel out geographic variables by comparing English- and French-speaking farmers within each of four areas, but their statistics for all areas combined inevitably reflect the fact that most British-origin farmers lived in the Eastern Townships.¹² In the English-speaking Eastern Townships region, geographic isolation had dictated a livestock-based economy from earliest settlement, while, as Isbister's tables demonstrate, most other Lower-Canadian farmers were only emerging from a grain-oriented agriculture at mid-century.

McInnis and Lewis calculate that in 1851 French Canadians achieved higher outputs per unit of "improved" land than did their English-Canadian counterparts, but McInnis has shown elsewhere that actual crop yields in the seigneuries were no higher than in the Townships.¹³ One of the main reasons for the apparently higher French-Canadian efficiency would be that in the stock-raising Eastern Townships, a higher ratio of the improved land presumably would have been in pasture. An acre of pasture obviously cannot produce as much revenue as an acre of crop, but it nevertheless can represent a rational use of resources, particularly if the land is rocky and steep-sloped, as in the Eastern Townships. The 1851 census enumerators were instructed to include all cleared land in the category of "improved" acreage,¹⁴ so it would appear that Lewis and McInnis are identifying the Eastern

9. *Capitalism and Material Life 1400-1800* (New York: Harper & Row Inc., 1975), p. 66.

10. ISBISTER, "The Efficiency," p. 681.

11. LEWIS and MCINNIS, "Efficiency," p. 513.

12. *Ibid.*

13. R.M. MCINNIS, "A Reconsideration of the State of Agriculture in Lower Canada in the First Half of the Nineteenth Century," in Donald H. AKENSON (ed.), *Canadian Papers in Rural History, III* (Gananoque, Ontario: Langdale Press, 1982): 18; "Some Pitfalls in the 1851-1852 Census of Agriculture of Lower Canada," *Histoire sociale — Social History*, XIV, no. 27 (1981): 227.

14. David P. GAGAN, "Enumerator's Instructions for the Census of Canada, 1852 and 1861," *Histoire sociale — Social History*, VII, no. 14 (1974): 361.

Townships' farmers as less efficient because they had relatively large cleared acreages, even though a significant percentage of those acres would have been rough pasture. Calculations of capital input should be expanded beyond the cost of livestock to include differences in the value of cleared acreage as well.

The failure to take into account the fundamentally different characteristics of livestock and grain production has not been confined to the econometricians. The same problem emerges in an article written by geographer Serge Courville, who has confined himself to comparisons of output in volume, market value (without transportation costs being accounted for) and crop yields.¹⁵ Courville, like McInnis, argues against the thesis of a French-Canadian agricultural crisis in the 1830s and 1840s. Though he fails to substantiate his argument that this period witnessed a significant transition from wheat to a livestock-based economy in the Montreal district,¹⁶ Courville does demonstrate that there was considerable sensitivity to market forces on the part of the French-Canadian farmers. The problem arises when he attempts to bolster his argument by making comparisons with farmers in English-speaking areas. Like McInnis and Lewis, he presents the statistics so that the advantages of the Townships are underestimated. Thus, in calculating crop production per acre, Courville simply divides the acreage of improved or cultivated land into the number of minots of grain and root crops harvested. He does this for comparative purposes only, but because the census definition of cultivated land includes land in pasture, and because acreage in hay cannot be subtracted, this calculation results in a particularly high distortion of the true crop yield for stock-raising areas.

Whereas Courville records the yield of the three Eastern Townships counties, Missisquoi, Sherbrooke and Stanstead, as 4.3, 5.3 and 4.4 minots per acre, respectively, in 1851, if one were to include in the calculation only land *actually in crop*, one would obtain 6.3, 8.0 and 7.0 minots per acre, respectively. In fact, because the 1851 census records the acreage planted in each food item, we can determine still more precisely what the true yield was for the crops included in Courville's calculations (wheat, barley, rye, peas, oats, buckwheat, corn, potatoes and turnips).

Table 1 Crop Yields in Selected Counties, 1851 (minots/acre)

| <i>Anglophone (Courville)</i> | | | <i>Francophone (Courville)</i> | | |
|-------------------------------|------|-------|--------------------------------|------|-------|
| Missisquoi | 25.5 | (4.3) | Bellechasse | 17.0 | (4.8) |
| Ottawa | 17.0 | (7.6) | Berthier | 14.4 | (6.2) |
| Sherbrooke | 23.4 | (5.3) | Chambly | 14.1 | (4.4) |
| Stanstead | 26.9 | (4.4) | Kamouraska | 17.1 | (4.9) |

Source: Census of 1851, Vol. II, Table 6, pp. 70-81, 94-99, 106-17, 136-47.

15. "La Crise Agricole au Bas-Canada. Eléments d'une Réflexion Géographique (première partie)," *Cahiers de Géographie du Québec*, 24, no. 62 (septembre 1980): 193-224.

16. Courville's totals (p. 205) for "animal units" per farm in the Montreal district are: 1831 — 7.15, 1844 — 6.05 and 1851 — 6.56. The major shift towards livestock took place in the fifties (animal units per farm in 1861 equalled 7.99). Courville's evidence that crop yields improved during the first half of the nineteenth century (p. 212) is also misleading because he apparently includes potatoes, the increased production of which would greatly inflate yields after the wheat crop failures of the thirties. The importance of potatoes is demonstrated by the drop in overall crop yields between 1844 and 1851 (7.9 to 5.5 minots/arpent), when potatoes were struck by blight.

Given the remarkable increase in yields recorded for the three Eastern Townships counties over those calculated even after we have eliminated land in pasture, it follows that much of their seeded acreage must have been in hay. The following table corroborates this hypothesis:

Table 2 Hay Production and Ratio of Improved Land in Pasture in Selected Counties, 1851

| County | Hay per farm (tons) | Pasture (%) |
|-------------|---------------------|-------------|
| Stanstead | 19.9 | 42.0 |
| Sherbrooke | 16.2 | 38.6 |
| Missisquoi | 17.5 | 38.0 |
| Chambly | 17.1 | 29.0 |
| Berthier | 5.9 | 39.2 |
| Bellechasse | 9.7 | 49.7 |
| Kamouraska | 9.5 | 42.8 |
| Ottawa | 6.5 | 40.3 |

Source: Census of 1851, Vol. II, Table 6, pp. 70-81, 94-99, 106-17, 136-47.

The above table also demonstrates that the three counties in the Eastern Townships did not have a higher proportion of their improved land in pasture than did the other counties chosen by Courville for comparison purposes; therefore it would follow that the acreage in hay must have been the only important cause for the higher degree of distortion in the true crop yields of the Townships.¹⁷

The same problem arises when Courville attempts to estimate agricultural profitability for different areas in 1844 by translating crop production, excluding hay, into dollars.¹⁸ He simply divides all improved land into the total crop value, again failing to account for the fact that livestock-producing areas would have much of this "cultivated" acreage in pasture and hay. The 1851 data just discussed would suggest that, while land in pasture probably is not a crucial factor for comparative purposes, land under hay certainly is. (We should note, however, that the areas compared in 1844 are not those referred to in 1851.) The result is that Courville arrives at the very questionable conclusion that large farms were not significantly more profitable than small ones. For example, Chambly had the largest average acreage in cultivation of his ten chosen parishes/townships, but the lowest average value in crop production per arpent. We have no way of knowing how much of the average farm's land was in pasture or hay in 1844, but, as the following table demonstrates, Courville's own statistics prove that Chambly farms had one of the highest concentrations of livestock:

17. This conclusion might appear to weaken my critique of McInnis and Lewis, but it must be remembered that Courville has chosen only four Francophone counties for comparison purposes, and that pasture land on the St. Lawrence farms would presumably be more likely than that on the larger and hillier Eastern Townships farms to be a part of the crop-rotation system. Consequently, even if seigneurial farms had high ratios of their improved land in pasture, that land would have had a comparatively high market value and have represented a greater investment than its equivalent in the Townships.

18. COURVILLE, "La crise," pp. 219-220.

Table 3 Agricultural Production in Selected Parishes/Townships - 1844
(Rank is in brackets)

| Parish/ township | Land cultivated per farm-arpens | Crop value (\$) per cultivated arpent | Animal units per farm* |
|---------------------|------------------------------------|--|---------------------------|
| Ste. Scholastique | 22.4 (10) | 4.03 (4) | 6.5 (9) |
| St. Eustache | 28.9 (8) | 3.47 (7) | 7.4 (8) |
| St. Martin | 26.5 (9) | 4.71 (2) | 6.0 (10) |
| St. Laurent | 42.0 (3) | 5.73 (1) | 8.3 (5) |
| Boucherville | 42.4 (2) | 3.33 (8) | 8.2 (6) |
| Chambly | 43.7 (1) | 2.68 (10) | 9.9 (3) |
| Monnoir | 30.0 (7) | 2.84 (9) | 7.8 (7) |
| Dunham (anglophone) | 36.9 (4) | 3.56 (6) | 11.3 (2) |
| Brome (anglophone) | 32.8 (5) | 3.70 (5) | 8.9+ (4) |
| Ascot (anglophone) | 32.6 (6) | 4.24 (3) | 13.3+ (1) |

* 1 animal unit = 1 cow, etc. = ½ horse = 6 sheep = 4 pigs

+ My calculations

Source: Courville, "La crise," pp. 215, 220.

It is clear that not only Chambly, but English-speaking townships as well, would rank higher in crop value per cultivated arpent if land in hay could be eliminated from the equation. And to gain a reasonably accurate view of comparative farm profitability, the value of livestock and dairy production would also have to be taken into account.

The task of comparing the agricultural integration of different regions into a market economy is clearly a very complex one. This paper does not pretend to provide any solutions to that problem, only to point out weaknesses in analyses attempted thus far. All the articles referred to are focused on the issue of agricultural crisis in nineteenth-century Quebec, and all make comparisons between French- and English-Canadian farmers in an attempt to place the question in perspective. Isbister demonstrates that Quebec's farmers were less productive than those of Ontario, but his view that a French-Canadian agricultural crisis did not end until well into the twentieth century contradicts his evidence on Quebec's increasing specialization in dairy production after 1850. At the opposite extreme, Lewis, McInnis and Courville compare French-speaking with English-speaking farmers in Canada East in an attempt to bolster the argument that there probably never was a French-Canadian agricultural crisis. Whether or not their thesis is correct, it is not strongly supported by comparisons

Table 4 Cattle and Dairy Production per Farm in Selected Counties, 1851

| | Milk Cows | Other Cattle | Butter (lb.) | Cheese (lb.) |
|-------------|-----------|--------------|--------------|--------------|
| Bellechasse | 3.6 | 4.0 | 162.4 | 0.4 |
| Berthier | 2.9 | 2.4 | 50.4 | — |
| Chambly | 4.0 | 2.5 | 136.8 | 5.4 |
| Kamouraska | 4.1 | 2.9 | 184.3 | — |
| Ottawa | 2.3 | 2.9 | 87.0 | 6.9 |
| Missisquoi | 4.0 | 6.0 | 195.0 | 113.7 |
| Sherbrooke | 2.9 | 5.3 | 156.6 | 48.2 |
| Stanstead | 3.2 | 6.7 | 205.7 | 44.1 |

Source: Census of 1851, Vol. II, Table 6, pp. 70-81, 94-99, 106-17, 136-47.

which underestimate the efficiency or profitability of a livestock-based economy. The key to rural progress in Quebec lay with the dairy industry, an industry in which the English-speaking farmers of the Eastern Townships clearly had a head start. The reason was not necessarily that they were more prescient or culturally predisposed to progress than their French-speaking counterparts in the seigneuries. As Courville points out, the Eastern Townships simply happened to enjoy the ironic advantage of isolation from the historically crucial St. Lawrence route to external markets. Local farmers could not export grain, but they could drive their cattle to Montreal or Quebec City. It was a short step from beef to dairy production once railroads began to improve access to a growing American (and later British) market.