

An Economic Analysis of Generic Fluid Milk Advertising in Ontario, Quebec, and the Maritime Provinces

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Over the last several decades, provincial milk boards in Canada have invested heavily in generic advertising of milk and dairy products. In 2004, Canada's farmers invested more than \$2.50 per person (\$84 million in promotion to 32 million Canadians) in these programs while U.S. producers spent less than \$1 per person (\$250 million in promotion to 281 million Americans). Such investment is undertaken with the intent of increasing consumption of milk and, given the supply management nature of milk production in Canada, raising producer revenues. Given the large amount of investment in advertising and promotion, it is important to conduct periodic economic evaluations to determine the profitability of these activities. While previous economic studies suggest that investment in generic fluid milk advertising does, indeed, generate a positive net return, there has not been an updated analysis of these activities for some time.

Accordingly, the objectives of this study are twofold. First, to provide an economic assessment of the responsiveness of fluid milk consumption to milk advertising and promotion in Ontario, Quebec, and the Maritime provinces over the last several years. Second, to broadly evaluate a possible

reallocation of advertising and promotion budgets between provinces. This analysis is conducted using econometric models of provincial or regional fluid milk demand in eastern Canada. The econometric results are used to simulate the impacts of various provincial advertising and non-advertising marketing (i.e. promotion, sponsorship, nutrition communication, public relations) scenarios for these three milk markets. First, two generic advertising scenarios are simulated: (1) a baseline scenario with generic advertising expenditures equal to historical levels, and (2) a no-advertising scenario, where generic advertising expenditures are set to zero. Based on the difference between these two scenarios, an average rate of return to advertising is calculated for each of the three regions. The average rate of return is a useful figure since it measures the overall profitability of the investment. Next, we simulate the impact of increasing advertising or non-advertising marketing expenditure by \$10,000 per quarter on consumption and producer revenues to ascertain the extent to which the resulting benefits exceed the costs in each region. Based on this simulation, a marginal rate of return to advertising and non-advertising

marketing elements is calculated for each region. These marginal rates of return to advertising and promotion are useful for evaluating the optimality of existing marketing campaigns.

In each market, per capita fluid milk sales are assumed to be affected not only by generic advertising and non-advertising demand enhancement expenditures (e.g., promotion, nutrition education, and sponsorships), but also by the retail price of milk, prices of substitutes for milk, consumer income, and seasonal indicator variables. While this was the initial specification used for each region, the final specification differs for each market in terms of which variables were included in the model. In addition, the dynamic effects of advertising and non-advertising marketing elements were modeled differently for each province. For example, for the Maritime region, only current advertising was included in the final specification. For Quebec, current and lagged advertising was included in the final specification. Lagged advertising captures any carry-over effect that advertising might have. Finally, in Ontario, lagged, but not current advertising was included in the model. These differences imply that the dynamic effects of advertising

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in each market are different, which may be related to the advertising campaign in each market and/or to differences in culture and demographics in each region.

The econometric results reveal that generic fluid milk advertising in all three markets had a positive and statistically significant impact on per capita consumption. Quebec had the highest advertising elasticity equal to 0.060, i.e., a one percent increase in advertising results in a 0.060 percent increase in per capita demand. The Maritime region had the lowest advertising elasticity of 0.014, while Ontario's equaled 0.027. A statistical test was conducted to determine whether these advertising elasticities were statistically different from each other. The results indicated that they were statistically different in each market.

Non-advertising marketing element elasticities were also measured. In Ontario, expenditures on these non-advertising demand enhancing elements (i.e. ingredient/calendar, nutrition communication, promotion and public relations/sponsorship) were not found to have a statistically significant effect on demand for fluid milk. It should be noted, however, that the impact of these non-advertising marketing elements appears to be persistent; the dynamics for the non-advertising marketing activities are long, ranging between three and six quarters back. Moreover, it must be noted that the absence of a statistically significant relationship does not imply that no relationship exists, but that there is more uncertainty with respect to the precise size of this effect. In the Maritime

region, the combination of promotion, nutritional communication, and sponsorship had a positive and marginally statistically significant impact on per capita milk demand. A one percent increase in expenditures on these activities was found to increase per capita milk demand by 0.008 percent holding all other demand factors constant. In Quebec, the combination of these activities had an elasticity value of 0.041, which was statistically significant.

A simulation model is developed for each province to simulate market conditions with and without generic milk advertising. These scenarios are used to calculate an average rate of return on investment to advertising. The average rate of return is greater than one in each region and is the highest in Quebec at 7.4, followed by Ontario at 3.4 and the Maritime region at 2.2. The average rate of return means that each dollar invested in generic advertising has generated \$7.40, \$3.40 and \$2.20 in net returns to dairy farmers in Quebec, Ontario and the Maritime region, respectively. These results suggest that dairy farmers are benefiting from generic milk advertising in each region of eastern Canada.

We also simulate market conditions based on several scenarios involving adding \$10,000 per quarter to advertising or promotion in each region in order to compute marginal rates of return. Marginal rates of return are used to determine whether more or less money should be allocated to the market. A marginal rate of return above 1.0 implies that extra money in advertising or non-advertising marketing activities would generate a

return for the incremental investment that is higher than its costs, and therefore is interpreted as under-spending. On the other hand, a marginal rate of return below 1.0 implies the opposite, i.e., too much money is being spent on the activity since the incremental costs are higher than its returns.

The impact of increasing advertising spending (by \$10,000 per quarter) is the greatest in Quebec, with a marginal producer rate of return of 5.04, followed by Ontario and the Maritime region with marginal producer rate of returns of 1.05 and 0.67, respectively. This implies that increasing advertising by \$10,000 per quarter would result in an average increase in farm revenues of \$50,400, \$10,500, and \$6,700 per quarter in Quebec, Ontario, and the Maritime region, respectively over this period. (Note that these calculations net out the marginal cost of production associated with producing more milk, as well as take into account a butterfat adjustment.) As for the impact of increasing expenditures on non-advertising demand enhancing activities, the impact is the greatest in Quebec, with a producer marginal rate of return of 3.95, followed by the Maritime region and Ontario with producer marginal rate of returns of 1.05 and 1.02, respectively. The latter number should be interpreted with caution because Ontario's elasticity coefficient for non-advertising activities is not statistically significant.

It is interesting to note that Ontario's marginal rate of return for advertising is close to 1.0, meaning that advertising spending in real

terms in that region seems nearly optimal (slightly under-investing). In Quebec, increasing advertising would generate benefits that are significantly larger than the costs of the additional spending. Regarding the Maritime region, increasing generic promotion would generate less net revenues than the cost of the investment. In all regions, but the Maritime region, an incremental increase in advertising spending of \$10,000 per quarter generates a better return than in the other non-advertising activities. Therefore, from an optimal point of view, Quebec should devote important parts of future budget increases to advertising. Among the three regions, Quebec would clearly benefit the most from an increase in advertising and promotion. Considering that the three regions have pooled their advertising and promotion budget, these results suggest that advertising and non-advertising spending should be increased in Quebec, maintained in real terms in Ontario, while advertising marketing expenditures spending should be reduced in real terms in the Maritime region.

Our analysis has concentrated on the important profitability measures, the APROR and MPROR. Further measures can be explored, such as the average rate of return (AROR), which is similar to the APROR with the difference that the marginal cost of producing the extra milk and the butterfat adjustment are not taken into account. The net average producer rate of return (NAPROR) can also be used. The NAPROR is simply the APROR from which advertising is netted out of the additional profit generated. Mathematically this can be simplified as $NAPROR = APROR - 1$. Another possible measure is the discounted average producer rate of return (DAPROR). DAPROR measures the additional producer profits generated by generic advertising, but discounted to present value to account for the time value of money. This measure is increasingly recognized as the most appropriate measure of the return of generic advertising to producers (Capps et al. 2003). The DAPROR for Ontario, Quebec and the Maritime region (Table 1) indicates that

an investment of \$1.00 in generic advertising would generate, when accounting for the time value of money, \$1.70, \$4.77 and \$0.91 to dairy farmers in Ontario, Quebec, and the Maritime region, respectively. So even though the simulation results suggest that Quebec farmers earned a profit of \$7.35 per dollar spent of the assessment they paid on average over the period 2000-2004, the actual return they earned is less after taking into consideration the opportunity cost of those assessments, i.e., the fact that the funds could have been invested in other financial instrument and earned a return if they had not been used to pay for generic advertising, the Quebec discounted average producer rate of return (DAPROR) is 4.77. The discounted results for the three regions studied indicate that generic advertising was successful in Quebec and Ontario, and marginally successful in the Maritime region for the period 2000-2004. Table 1 summarizes the various measures of advertising investments for dairy producers in the three regions studied.

Table 1. Return on fluid milk generic advertising investment for producers, 2000-2004.

	Ontario	Quebec	Maritime
Added milk receipts (\$ million)	415.1	528.8	46.6
Advertising expenditures (\$ million)	47.6	28.2	8.2
Average rate of return (AROR)	8.8	18.9	5.7
Average marginal cost of production (\$/hl)	29.87	29.87	29.87
Marginal cost of added milk produced (\$ million)	179.1	228.1	20.1
Added receipts minus added marginal costs (\$ million)	236.0	300.7	26.5
Average producer rate of return (APROR)	3.4	7.4	2.2
Net average producer rate of return (NAPROR)	2.4	6.4	1.2
Discounted average producer rate of return (DAPROR)*	1.7	4.8	0.9
Marginal producer rate of return (MPROR)	1.1	5.0	0.7

* The interest rate on 30 days treasury bills used as the discount rate.

Source: Authors' calculation.

CALL FOR PAPERS NEC-63 FALL 2006 MEETING

The Fall meeting of NEC-63, The Research Committee for Commodity Promotion, is tentatively scheduled for October 12-13 in Auburn, Alabama at the Robert Trent Jones golf facility. The purpose of the meeting is to discuss current research on commodity promotion. Of particular interest is research that advances the state-of-the-art in measuring the economic impacts of promotion, research, and other activities funded by producer checkoffs. Also of interest is research on export promotion activities sponsored by USDA's Foreign Agricultural Service.

If you would like to present a paper, please email a title and abstract of 500 words or less to Henry Kinnucan at kinnuhw@auburn.edu. Abstracts received before 31 July 2006 will be given preference in putting together the program. For additional information about NEC-63 and updates on the meeting, see the web site www.nec63.org.

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October 12-13, 2006

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