Dairy research: "Real" science or marketing?

To say that Anna Pippus was unimpressed by the press release would be an understatement. "This is outrageous," she recalls thinking after reading it. "This is so unscientific. It's totally improper."

Though she is not a politician or a scientist, Pippus is interested in politics and research — specifically, policies and studies that affect farm animals. As the director of farmed animal advocacy for Animal Justice, a Canadian law organization dedicated to animal rights, it's her job to stay abreast of agricultural news. That's how, earlier this year, she came across a press release announcing federal funding for dairy research in Canada, a portion of which was earmarked to study the impact of dairy fat on cardiovascular health in humans.

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The dairy industry spends millions each year on research, much of it in the areas of nutrition and human health.

What really bothered Pippus were the quotes in the press release. In the first one, Lawrence MacAulay, federal minister of agriculture and agri-food, said the investment would "help maintain consumer confidence in the nutritional value of dairy products." In the second quote, Wally Smith, president of Dairy Farmers of Canada, said the research would "improve our understanding of the nutritional value and health benefits of milk products."

These quotes suggest the goal was not to conduct "real" scientific research, Pippus wrote in a media release for Animal Justice, but rather to find data to support the "dubious" preordained conclusion that dairy fat products benefit cardiovascular health.

"You have this whole stream of positive studies coming out because the federal government and the Dairy Farmers of Canada are pumping all this money into what is basically a wild goose chase," says Pippus. "It's a really clever way to advertise because it's effective. If you put the word 'science' on it, consumers trust it a lot more."

In Canada, the federal government has partnered with the dairy industry to form the Dairy Research Cluster. For the second phase of this initiative (2013–2018), Agriculture and Agri-Food Canada has contributed more than $13 million (including the $1.75 million announced in the press release), with additional funding coming from Dairy Farmers of Canada ($5.3 million), the Canadian Dairy Network ($669 000) and the Canadian Dairy Commission ($750 000). The overall objective of the program, which currently funds 23 research projects conducted by more than 100 scientists, is to "promote the efficiency and sustainability of Canadian dairy farms, grow markets and supply high-quality, safe and nutritious dairy products to Canadians."

Many of these research projects are in the areas of nutrition and human health, including one to "uncover the role of dairy products in decreasing risk for diabetes in vulnerable populations," one to "evaluate the benefits of a high dairy intake in pregnancy" on bone health for mothers and their offspring in early life, and another to find evidence that "milk and fermented dairy products counteract obesity and cardiometabolic diseases by modulating inflammation in intestinal and adipose tissues."

Though it is difficult to assess the quality of the research from the short descriptions of the projects online, it does appear that the results may have already been decided, noted Dr. Karl Michaëlsson, a professor in the department of surgical sciences at Uppsala University in Sweden. "Most likely, those who select projects to be funded … will possibly try to select projects that express a wish to present dairy in a positive way," Michaëlsson wrote in an email to *CMAJ*. "A 'good' scientific result is worth a lot for the industry."

Michaëlsson is the author of a 2014 observational study in *BMJ* that found high milk intake to be associated with higher mortality in both men and women, and also with a higher incidence of fracture in women. The study was supported by grants from the Swedish Research Council, not the dairy industry. According to Michaëlsson, an industry-sponsored researcher who "does not render appropriate results" isn't likely to see that funding prolonged. "Therefore, both the funder and the researcher have an economic interest to produce the right results."

It is well known, of course, that studies with industry funding are more likely to have results favourable to sponsors than those without contributions from the private sector. This has been shown in many reviews of scientific literature. The

correlation appears particularly strong for research with ties to food companies. Marion Nestle, author of Food Politics and the Paulette Goddard Professor in the Department of Nutrition, Food Studies and Public Health at New York University, has been informally tracking studies with connections to the food industry for more than a year. Of the 168 studies she came across between March 2015 and March 2016, only 12 had results unfavourable to a sponsor's interest. In other words, the success rate was 93%.

In an email to *CMAJ*, Nestle said the dairy industry is funding studies in part because their products are "under siege" by some critics who think "dairy foods are poison." She cited T. Colin Campbell, professor emeritus of nutritional biochemistry at Cornell University, as an example. In articles posted on the website of the T. Colin Campbell Center for Nutrition Studies, Campbell says there are many "frightening facts" about milk, and claims, among other "provocations," that dairy protein causes cancer.

"The US Dairy Council sends me every study that proves the benefits of dairy for health, but not the ones that don't," wrote Nestle. "If the purpose of the studies is to promote dairy foods, the studies are about marketing, not health."

Canada's Dairy Research Cluster, however, defends the integrity of the research it funds. In an email to *CMAJ*, Shelley Crabtree, a communications specialist with the cluster, said the research is impartial and unbiased. The studies funded by Dairy Farmers of Canada in nutrition, food science and health are chosen by an independent committee of experts, who must disclose any possible conflicts of interests. If committee members are also applying for funding from Dairy Farmers of Canada, they must leave the room when their proposals are assessed for scientific merit. They are also precluded from discussions about projects associated with their employers (such as a university) or a co-investigator on another project.

The decision to publish findings "rests solely with the researchers," she noted, adding that sources of funding are always disclosed to ensure transparency. "Researchers maintain complete independence in conducting their study, owning their data and reporting the outcomes, regardless of the studies' results," wrote Crabtree. "We are confident that researchers from Canadian universities that receive funding from [Dairy Farmers of Canada] are committed to solid, credible and ethical science that can stand the test of time."

As for Agriculture and Agri-Food Canada, the department "assesses the soundness of a project's research methodology through a scientific peer-review process in which every proposal is reviewed by one or more scientists with an appropriate scientific specialty," James Watson, a media relations representative, said in an email to *CMAJ*. "In order to preclude any conflict of interest, these assessing scientists must not be connected to the project in any way."

One study funded by Dairy Farmers of Canada and conducted by researchers at Brock University is examining the role of dairy products in weight management for teenage girls. In an email to *CMAJ*, Andrea Josse, assistant professor of kinesiology and one of the researchers, said there are no conditions attached to the funding. Josse noted that Dairy Farmers of Canada did not design or commission the study, and her team is free to publish the results, however they turn out, in the journal of their choosing.

"I am not 'concerned' that my work may turn into promotional material for the dairy industry. If they can use our data/research in a positive way to encourage more consumption of dairy in populations that don't consume enough (according to Canadian statistics), then that is fine by me," wrote Josse. "We believe in the health benefits of dairy (particularly in adolescents — which is the population we're doing our study in), so if we see good results, we hope they are disseminated accordingly by both [Dairy Farmers of Canada] and Brock University." — Roger Collier, *CMAJ*

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Drugs are going missing, but why?

Dr. Jacalyn Duffin, a hematologist and medical historian at Queen's University, Kingston, Ontario, first became aware that certain drugs were sometimes getting hard to find in 2010, when her patient at a cancer clinic wanted to stop chemotherapy because she couldn't get prochlorperazine, a common antinausea drug.

Duffin was shocked. "I just couldn't believe that it was gone. It is a very old, reliable drug that has been around for a long time and it was the only one that worked for her."

Duffin started investigating and quickly discovered the problem went far beyond an old antinausea drug. "It's affecting all classes of drugs, as far as we can tell. There are drugs missing for treating mental illness, there are chemotherapy drugs missing in cancer care, there are painkillers missing, there are anti-inflammatory drugs that have gone missing, there are blood pressure drugs that have gone missing, there are antibiotics that have gone missing."

The problem is found in many countries, though the form may differ by jurisdiction. In the United States, for example, a lot more injectables are missing than in Canada, said Duffin.

But more worrying than the missing drugs, she said, is that we don't really know how big the problem is, or what is causing it. "Nobody is measuring it properly," she said. "And without measuring it properly, it is very hard to describe it and to know if it is getting better, or getting worse."

To try to fill that gap, Duffin has been collecting reports of shortages, possible causes and patient stories on her website, www.canadadrugshortage.com.

A possible clue to the cause of the shortages may be in the one thing they mostly have in common: the missing drugs are usually generics. In other words, they are older drugs without patent protection. These drugs are less lucrative than new blockbuster drugs or most drugs still on patent, and com-