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Welcome to ON Organic

Evan Elford, New Crop Development Specialist, OMAFRA

We hope you enjoy this month's newsletter with information on the fatty acid profile in Ontario organic milk and learning the difference between downy and powdery mildew in various crops. Additionally, make sure to note the public review taking place until September 22, 2014 of the proposed changes to the Canada Organic Standards.

September also brings Organic Week (September 20-28, 2014)! To learn more about events taking place in your area please visit the Organic Week website at www.organicweek.ca.

As always, we want to hear from you! Are there livestock, crop or business management issues you are facing or would like to learn more about? Please let us know so we can address it for you (and others) in an upcoming newsletter!

We welcome your comments and any suggestions for topics in the newsletter. Thank you once again to our contributing authors and to EFAO, OCO and others who pass along our newsletter on a regular basis.

Subscription to this newsletter is easy and no cost. For details go to the webpage: <http://www.omafra.gov.on.ca/english/subscribe/indx.html#organic>

The newsletter is also posted on the OMAFRA website at: <http://www.omafra.gov.on.ca/english/crops/organic/news/news-organic.html>

The French version of these newsletters is available at: <http://www.omafra.gov.on.ca/french/crops/organic/news/news-organic.html>

The OMAFRA Organic pages are linked from: <http://www.ontario.ca/organic> and <http://www.ontario.ca/biologique>

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A Look at The Fatty Acid Profile of Milk from Ontario Organic Dairy Farms

Ron Lackey, OMAFRA Feed Ingredients and By-products Feeding Specialist

Consumers are becoming more focused on the importance that food can play in maintaining a healthy lifestyle. Mounting evidence from research and consumer awareness about the potential health benefits of various components in our foods has given rise to the concept of functional foods and has created a demand for foods with improved nutrient profiles.

Milk fat contains approximately 400 different fatty acids, which make it the most complex of all natural fats. Fatty acids such as EPA (eicosapentaenoic acid), DHA (docosahexaenoic acid) and CLA (conjugated linoleic acid) are examples of such functional food components that are found in cows' milk. One of the goals of the dairy industry in the last 25 years has been to enhance the concentration of these fatty acids that may have beneficial effects in humans. To achieve this, the main objective has been to improve the ratio of unsaturated fatty acids to saturated fatty acids.

The consumption of more omega-6 fatty acids than omega-3 fatty acids is a well-known risk factor for a variety of health problems, including cardiovascular disease, cancer, excessive inflammation, and autoimmune diseases. The higher the ratio of omega-6 to omega-3, the greater the associated health risks. Western diets typically have a ratio of about 10 - to -1 to 15- to -1 or more, while a ratio of 2.3- to -1 is thought to maximize heart health. Considerable research has taken place in recent years that is focused on strategies that are capable of altering the fatty acid profile of cow's milk to achieve a fatty acid profile consistent with consumer perceptions and health recommendations. The nutritional enhancement of omega-3 and CLA are of particular interest because of their potential benefits to human health.

The milk fatty acids are derived almost equally from two sources, the feed and the microbial activity in the rumen of the cow. Generally speaking, concentrations of CLA can be more easily enhanced through diet formulation and nutritional management of dairy cows, than EPA and DHA. However, many factors are associated with the variations in the amount and the fatty acid composition of the fat component of cow's milk. These factors may be of

animal origin, i.e. related to genetics (breed and selection), stage of lactation, mastitis and ruminal fermentation, or they may be feed-related factors, i.e. related to fibre and energy intake, dietary fats, and seasonal and regional effects.

The predominate feed sources of polyunsaturated fatty acids in ruminant diets are linolenic acid, derived principally from forage crops, and the other is linoleic acid, a major component of oilseeds and concentrates that are fed to dairy cows. The predominate form (isomer) of CLA in milk is referred to as rumenic acid and it is produced by the biohydrogenation of linoleic acid. Vaccenic acid is another isomer of CLA formed from both linoleic acid and linolenic acid.

A large body of research has shown that grass and legume forages can promote cow health as well as potentially enhance the fatty acid profile of the milk fat. The feeding and management protocols of organic milk production, where there is a greater reliance on pasture and forage-based feeds and less reliance on grains, should theoretically result in the production of milk with a fatty acid profile that is potentially healthier for consumers.

Researchers Alan Fredeen and Payam Vahmani from Dalhousie University recently reported on a project where they set out to test the assumption or hypothesis that the fatty acid profile in organic milk is improved relative to conventionally produced milk, with the difference being related to feed. This project involved the participation of 36 dairy farms in Ontario, with 14 of those farms being organic (Org) and 22 being conventional (Con). Milk samples from the bulk tank and feed samples from the major forages fed were taken between September 2011 and November 2011 and referred to as the fall period (F), samples taken from April 2012 to May 2012, were referred to in this study as the spring group (S). Both milk and feed samples were analyzed for fatty acid composition. Researchers found large variations in feed composition due to the wide range in feeds used in the cows' diets. The average forage composition of the diets is shown in Table 1. On average, organic farms in this study milked 74 cows per farm while the conventional farms milked 60 cows.

A Look at The Fatty Acid Profile of Milk from Ontario Organic Dairy Farms (Cont'd)

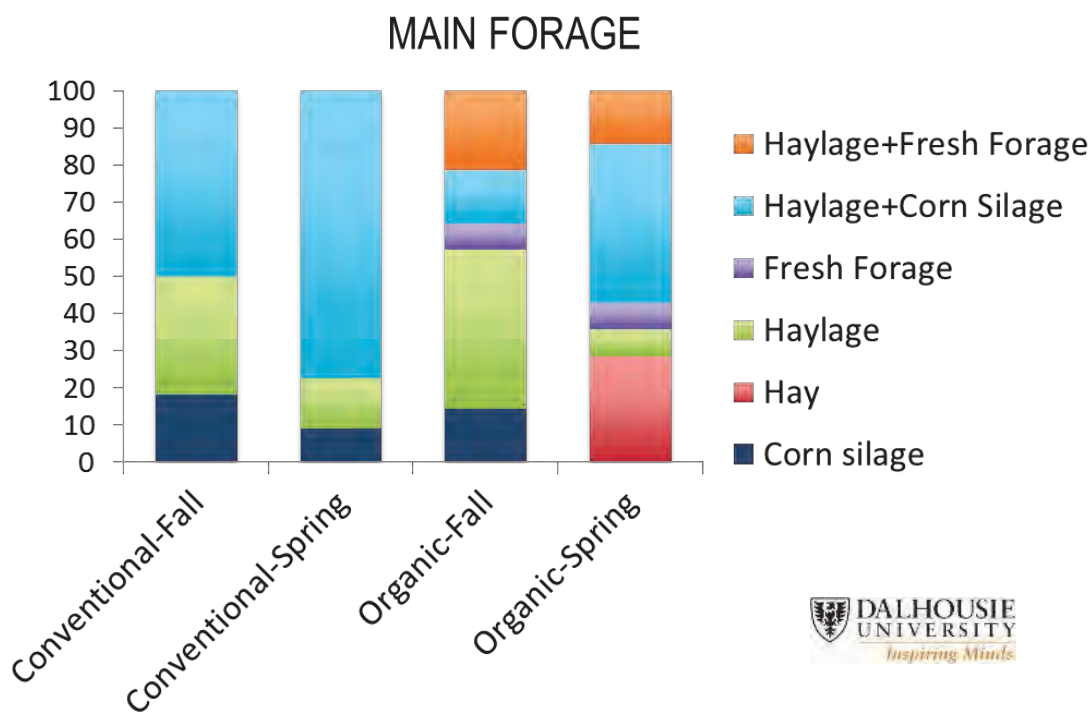


Table 1: Average Forage Composition of Diets

Highlights of the Ontario Study

- Differences in milk fatty acid profiles between organic and conventional in this study were small.
- Milk content of rumenic and vaccenic acid (CLA isomers) were highest in the OrgF milk (Table 2)
- The forage content of alpha linolenic acid was highest in the OrgF group (25.8+/-4.0%) followed by Con-F (8.6+/-4.5%); Org-S(5.7+/-3.2%); Con-S(3.70+/-1.36%)
- Organic milk had a higher content of stearic acid and alpha linolenic acid compared to the conventionally produced milk.
- The ratio of Omega 6 to Omega 3 fatty acids in the organically produced milk was much lower – which is considered healthier.

	% of Total FAs	% Rumenic Acid	% Vaccenic Acid
Organic Fall	5.19	.68	1.79
Organic Spring	4.09	.45	.91
Conventional Spring	4.51	.47	.89
Conventional Fall	4.33	.45	.90

Table 2: Rumenic and Vaccenic Acid (CLA isomers) Content in Milk Samples.

A Look at The Fatty Acid Profile of Milk from Ontario Organic Dairy Farms (Cont'd)

Based on the results of several previous studies, providing cows with fresh pastures resulted in a two to three fold increase in the CLA content of milk fat, but this effect diminished as the pastures matured. Another interesting point is that the enhanced levels of CLA in milk cannot be totally accounted for by the fatty acid composition and supply of polyunsaturated fatty acids that fresh grass provides. Therefore, other unknown factors or components of grass are thought to promote the production of vaccenic acid (CLA) in the rumen.

While the conclusions of this Ontario study of comparing the fatty acids of organically produced milk versus conventionally produced milk suggest that the organically produced milk is slightly more healthful for consumers, further research to improve

the knowledge about the effects of different grass and forage species; the importance of fresh grazing and the possible effects of the season would be useful to organic dairy producers who have an interest in enhancing the content of beneficial fatty acids in the milk that they produce.

References

Lock, Adam. L. and Bauman, Dale E. 2004, *Modifying Milk Fat Composition of Dairy Cows to Enhance Fatty Acids Beneficial to Human Health*, *Lipids*, Vol.39, no.12 (2004)

Fredeen, A., Tucker, A., Levison, L., Bergeron, R., Vahami, P., and Devries, T., *Milk Fatty acid profile of organic farms in Ontario*. *Canadian Journal of Animal Science*, 2014 94(1):175-222

Not All Mildews Are Created Equal!

**Sean Westerveld, OMAFRA Ginseng and Medicinal Herbs Specialist
and Melanie Filotas, OMAFRA IPM Specialist for Specialty Crops**

Over the last few weeks we've had a number of questions about "mildew". Mildew can refer to either downy or powdery mildew, and it seems that some growers have been confusing the two. While both cause fuzzy growth on plant leaves, that is where the similarities end. Downy and powdery mildew are actually very different diseases with different management strategies, and mistaking the two can be costly.

Downy and powdery mildew are common to a wide variety of fruit, vegetable and even some field crops. They tend to be relatively specific, attacking only one or a few closely related crops. So, for example, the downy mildew of basil will not affect cucurbits, and vice versa. Some crops are affected by both a powdery mildew and a downy mildew disease.

Although downy mildews are often thought of as fungal diseases, the pathogens involved are actually water moulds, and more closely related to certain algae. Downy mildews can only infect if free water is present on leaf surfaces, which is why these diseases often become worse with rainy weather and, in some crops, do not occur during dry years.

Infection in most crops leads to angular, yellowish or olive green lesions on the upper surface of leaves (Figure 1), and white, grey, purple or dark sporulation on the lower leaf surface (Figure 2). This sporulation is not always present, and is most easily observed when leaf surfaces are wet or in the early morning before the spores are blown off of the plant. After 1 to 3 weeks affected leaves will die or fall off of the plant. Downy mildews are often more devastating than powdery mildews, leading to complete canopy destruction if not controlled preventatively. They are much harder to control than powdery mildews.

In contrast, powdery mildew diseases are caused by various species of fungi. Spread of powdery mildew is favoured by moderate temperatures and high humidity. Free water is not required for infection, so spread of the disease can occur even without rainy weather. The disease usually begins in late summer when the foliage is already weakened and humidity is higher around the leaves within the dense canopy. Powdery mildew causes a white or grey powdery fungal growth, which can occur anywhere on the leaf but is more common on the upper leaf surface (Figure 3).

Not All Mildews Are Created Equal! (Cont'd)

The fungus grows predominantly on the leaf surface. Symptoms can start as roughly circular patches of white growth, but later the entire leaf surface becomes uniformly covered with the fungus. After several weeks the leaves continue to weaken and eventually turn yellow and die, but the progress is usually slower than downy mildew. Powdery mildew species both grow and sporulate on the leaf surface while downy mildew grows inside the leaf tissue, with only the spores produced on the leaf surface.



Figure 1: Early symptoms of downy mildew on basil showing yellowing within a section of the leaf confined by the veins.



Figure 2: Sporulation on the lower leaf surface of an infected basil leaf early in the morning leads to a downy appearance. Later in the day, spores will no longer be present.



Figure 3: Symptoms of powdery mildew on Jerusalem artichoke. The disease has progressed to cover the entire leaf surface. Eventually leaves will turn yellow and fall off of the plant.

Control of these diseases in organic production can be very challenging. There are relatively few organically acceptable fungicides registered and even fewer will have efficacy against both diseases. Prior to application of any product, growers should ensure that products used are registered for use in Canada by the PMRA and are permitted by their certification body.

There are more products registered for use on powdery mildew than for downy mildew, although most will provide suppression rather than control. Most of these products will have no effect on downy mildew. Homemade pesticides are also more likely to be effective against powdery mildew, as almost all popular recipes will only kill on contact and powdery mildew grows on the leaf surface where it can be easily contacted. They will not have much effect on downy mildew, since the pathogen grows within the leaf where the product cannot reach them. Copper is one example of an organically-acceptable pesticide that can control or suppress both diseases. However excessive use of copper can cause damage to the soil microflora and in some crops (e.g. cucurbits) copper can even be phytotoxic. Additionally, downy and powdery mildew are caused by different species on different crops, so management strategies that work on one crop may not work on another.

Not All Mildews Are Created Equal! (Cont'd)

Other than copper, very few organically-acceptable pesticides provide any control of downy mildew. Research at the University of Guelph on a range of products on basil downy mildew over a three-year period did not identify any organically-acceptable pesticides that could provide more than a very slight reduction in the severity of the disease. The main tool for organically managing both downy and powdery mildew is reducing or avoiding the conditions that lead to early disease or severe infections.

This can be accomplished by choosing cultivars that are less susceptible to the disease most prevalent or damaging on your crop and farm, if available, ensuring wide plant spacing to avoid a dense canopy with limited air flow, avoiding overhead irrigation, and planting in an open location exposed to the prevailing winds. In some cases, removing and destroying the first infected leaves or stems will reduce inoculum and delay the onset of severe symptoms, but this requires frequent and careful scouting.

Canada Organic Standards Review Update

From The Organic Federation of Canada InfoBio

The Canadian Organic Standards is now under review, and many modifications are suggested in order to modernize and clarify organic practices. A **public review** is currently open, until **September 22nd 2014**, in order to gather feedback from organic operators and the public.

To consult the proposed modifications, click on the following links:

General Principles and Management Standards

[A draft version with tracked changes](#)

[A “clean” draft version](#)

Permitted Substances Lists

[A draft version with tracked changes](#)

[A “clean” draft version](#)

To submit a comment:

Submit comments on the proposed changes to either or both CAN/CGSB-32.310 General Principles and Management Standards and CAN/CGSB-32.311 Permitted Substances Lists, please use the following form: 32-20 Comment Form - formulaire pour commentaire

Learning Opportunities

Nutrient Management eLearning Courses

We heard your requests!

The Ministry of Agriculture, Food and Rural Affairs has online nutrient management courses!

Our training courses give learners the tools to safely manage nutrients while protecting the environment. Take our courses to become a government-certified Nutrient Management Planner or Consultant.

Our eLearning format allows you to learn on your own time and at your own pace. The newest eLearning course – Introduction to Nutrient

Management – provides a basic understanding of nutrient management best management practices. This course will be of interest to a wider audience beyond those who require certification.

Visit the [University of Guelph Ridgetown Campus](#) website for more information on in-class and online nutrient management training options.

Contact the University of Guelph Ridgetown Campus for more information:

Toll Free: 1-855-648-1444

Email: mmcdonal@uoguelph.ca

Learning Opportunities (Cont'd)

Nutrient Management eLearning Courses

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Toll Free: 1-855-648-1444

Organic Seed Workshops, 2014 – Presented by Everdale

As part of their work for The Bauta Family Initiative on Canadian Seed Security, Everdale is offering a special series of organic seed production workshops in 2014 across Ontario.

Wednesday, September 24	Fundamentals of Seed Production	Guelph Centre for Urban Organic Farming
Saturday, September 27	Seed Production Trials and Selection	Everdale
November 7-9	ECOSGN 2014: Seed Connections	Sainte-Anne-de Bellevue, Quebec

For more information on seed workshops near you, please visit the Everdale website at: <http://everdale.org/workshops/organicseed/> or contact Aabir Dey, Regional Coordinator for the Bauta Family Initiative on Canadian Seed Security for Ontario at 519.855.4859 ext.103; email: aabir.dey@everdale.org.

EFAO Ecological Fruit Production Course for Small to Medium Scale Orchards Fall Session II

Date: Saturday October 18, 2014, 1-4pm

Location: Orchard Park Office Centre. Ignatius Farm Guelph, ON

Member Prices: member - 1 Individual (s) - \$65.00

Non-Member Prices: non-member - 1 Individual (s) - \$75.00

For more information please visit the EFAO website at <https://efao.ca/upcoming-events/>

Conferences, Meetings and Tours

Ontario Organic Roadshow – Presented by the Organic Council of Ontario

OCO is proud to be part of Canada's new "Think Before You Eat" Campaign. Organic remains the best choice to reduce exposure to pesticides and GMOs. Products sporting the Canada Organic Logo have met or exceeded rigorous standards and are third-party inspected annually. Great tasting, fresh organic fare from Ontario's best companies!

The Ontario Organic Roadshow will support producers and retailers to share the good news of organics, including helping people find foods that are both Local AND Organic- better together.

In addition to samples and information on pioneers and innovators, OCO will bring the latest information and insights on organics with our 10 minute power presentations throughout the Roadshow. And look for the first in our Think Before You Eat video series "Think Animal Welfare". To be a part of the Roadshow as a host or a sponsor, please contact event coordinator Jennifer Berman Diaz at marketing@organiccouncil.ca



Dates and Locations:

September 20, Organic Garage, Oakville
September 21, Organic Garage, Vaughan
September 27, The Big Carrot, Toronto
September 28, TBD
October 4, TBD
October 17-19, Delicious Food Show, Toronto
October 24-25, Nature's Emporium, Newmarket

For more information, please visit the OCO website at: www.organiccouncil.ca

Organic Week, September 20-28, 2014



For more information about Organic Week 2014, please visit the website at www.organicweek.ca.

Canadian Greenhouse Conference

Date: October 8-9, 2014

Location: Scotiabank Convention Centre, Niagara Falls, Ontario

For more information please visit the website at: www.canadiangreenhouseconference.com/.

Conferences, Meetings and Tours (Cont'd)

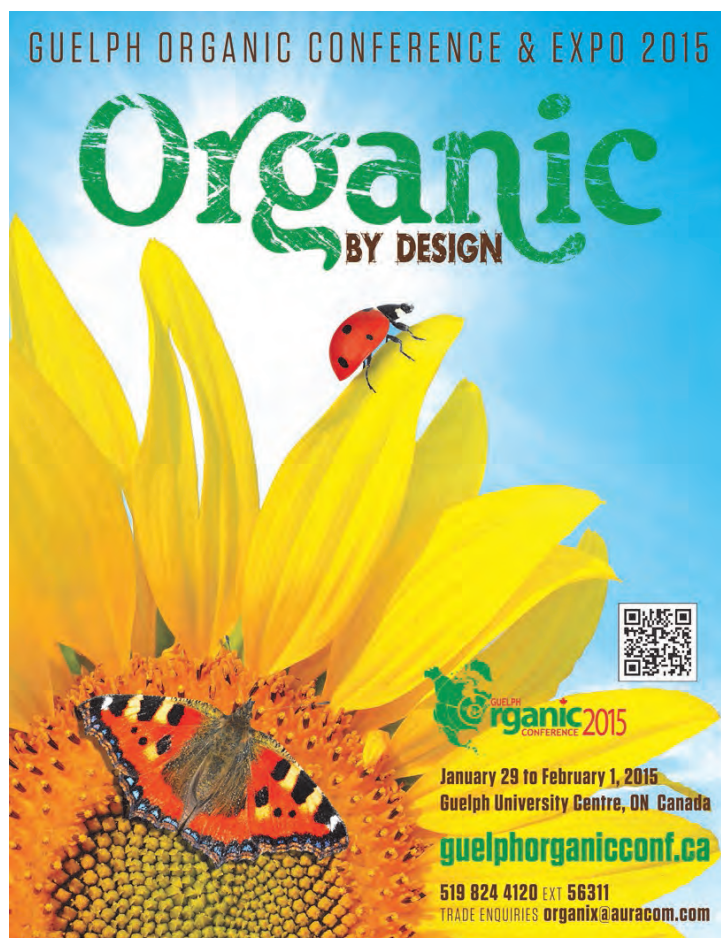
Organic by Design

34th Annual Guelph Organic Conference

Date: January 29-February 1, 2015

Location: University of Guelph, Guelph, Ontario

For more information please visit the website at: <http://www.guelphorganicconf.ca/>



Getting to the Roots: Successful Organic Farming

Eco Farm Day, 2015

Date: Saturday, February 21, 2015

Call for Volunteers: Volunteers are currently being invited to join the Eco Farm Day Organization Team to complete the plans and take on various essential roles to make this conference happen for organic farmers in Eastern Ontario and Western Quebec.

If you are interested in volunteering at Eco Farm Day 2015, please contact Coordinator of Volunteers, Johanna at cogoso.volunteers.jc@gmail.com and cc Gary Weinhold at weinhold_g@yahoo.ca.

For more information about Eco Farm Day 2015, please visit the COG website at: <http://cog.ca/ottawa/eco-farm-day/>

Links to ON Organic Information & Staff Contacts

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Links to Organic Agriculture Information

Organic Council of Ontario (OCO)

<http://www.organiccouncil.ca>

Canadian Organic Growers (COG)

<http://www.cog.ca>

OMAFRA Organic Agriculture

<http://www.ontario.ca/organic>

Ecological Farmers of Ontario (EFO)

<http://www.efao.ca>

Organic Agricultural Centre of Canada

<http://www.oacc.info>

FarmStart www.farmstart.ca

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