

Dairy Goat Digest



Information for Ontario's Dairy Goat Industry provided by the
Ontario Ministry of Agriculture, Food and Rural Affairs

Winter 2019

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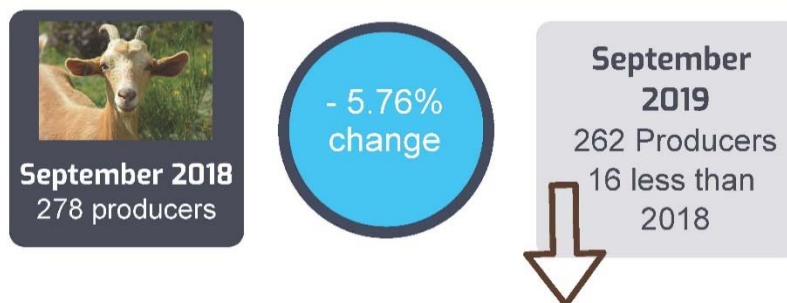
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INDUSTRY SNAPSHOT:

Key statistics for Ontario's Dairy Goat Industry

Goat Milk Producers in Ontario

Comparing September 2018 to September
2019



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Recent Averages for Milk Quality Measures – compared to the same period last year

Measures	Regulatory Standards	2019 July - September	2018 July - September	Difference	% Difference
Bactoscan: ibc/mL	<=321,000	90,000	80,000	+10,000	12.5%
Somatic Cell Counts (SCC): SCC/mL	<= 1,500,000	1,178,000	1,160,500	+17500	1.5%
Freezing Point: °Celcius*	>-0.534	-0.543	-0.543	0	0.0%
% Fat	-	3.47	3.41	+0.06	1.76%
% Protein	-	3.21	3.18	+0.03	0.94%

*Changes in the concentration of solids and salts will cause milk to freeze at different temperatures. Dilution of milk with water progressively gives a freezing point closer to that of water. Results closer to zero (greater than) -0.566 °Hortvet (-0.547° Celsius) are considered abnormal for goat milk.

Percentage of Producers in Bactoscan Range – compared to the same period last year

Bactoscan: ibc/mL	2019 September	2018 September	Difference	Comment
<35,000	9.8%	14.9%	-5.2%	Excellent milk quality ¹ .
35,000-100,000	54.7%	47.5%	+7.2%	Good milk quality
101,000-321,000 ² .	29.8%	28.5%	+1.3%	Acceptable milk quality, however check milking equipment and procedures ²
>321,000	5.7% ³ .	9.1%	-3.4%	Poor milk quality. Seek advice ³
Totals	100.0	100.0	-	

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¹. While the combined % of producers marketing either good or excellent quality milk has remained steady, when compared to the same period last year, the proportion of producers marketing excellent quality milk is down.

². This illustrates the proportion of goat milk producers who are shipping milk with bacterial levels approaching the regulatory limit. Producers that consistently fall in this category should consider examining their milking process and equipment for potential issues.

³. 5.7% of producers are shipping milk above the regulatory standard of 321,000 ibc/mL which is a reduction in the percentage of farms marketing poor quality milk.

Bulk Tank Rejections

Phillip Wilman, Raw Milk Quality Program Coordinator, OMAFRA

Consumers place a great deal of trust in farmers to produce high quality and safe food. As a dairy goat producer, you take great care and pride in the milk you offer for sale. Most of the time, that milk is of excellent quality and is suitable for consumption. There are a few instances, however, where the milk may not be suitable or safe for consumption. Your Bulk Tank Milk Grader (BTMG) is tasked with the very important role of assessing your milk for suitability prior to the milk leaving the farm. A certified BTMG may reject milk for any of the following reasons;

- the milk contains foreign matter like flies, straw, black specs
- the milk has an odour other than that of clean fresh milk
- the milk is too warm.

The BTMG can also reject the milk if the milkhous or surroundings are such that the BTMG cannot grade the milk by sight or smell. For example, if the milkhous has been recently cleaned with strong smelling chemicals and the BTMG cannot distinguish between odours on the milk and odours in the milkhous, the BTMG can reject the milk. To date in 2019 there have been 12 instances where a BTMG rejected the milk in a farm bulk tank. The most common reason for rejection remains the presence of flies and/or maggots. Other reasons for rejections this year have been milk too warm and off flavour/odour.

The most common maggot identified during rejections is the rat-tailed maggot. The rat-tailed maggot is the larval stage of the drone fly, also known as the false honeybee. Rat-tailed maggots live in stagnant, nutrient rich water, such as that found in floor drains, or other standing water in or near a milkhous. Keeping drains clean, flushing

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drains with plenty of clear water and ensuring areas around the milkhouse are properly graded and drained will help reduce the presence of these maggots.

Flies continued to be a problem this year, similar to years previous. Ensuring all openings to the milk house are tightly screened, keeping doors closed and proper use of fly control products can drastically reduce the fly population. Ensuring all used milk filters are rinsed, prior to being disposed of in a garbage receptacle with a tight-fitting lid, will also help.



Drone fly, also known as the false honeybee

A reminder that when a BTMG rejects milk, their decision is final. Regulation 761 of Milk and Milk Products under the *Milk Act* requires that rejected milk be emptied from the tank and disposed of, and the tank rinsed, washed and sanitized prior to milk being added to the tank.



Rat-tailed maggot, larval stage of the drone fly

The Importance of Working-Up Abortion Cases

Brought to you by:
the Ontario Animal Health Small Ruminant Network



Chlamydia abortus, *Coxiella burnetii*, *Campylobacter spp.* and *Toxoplasma gondii* are the most common causes of infectious abortion in goats and sheep in Ontario. These agents not only cause abortion but also cause fetal death, mummified fetuses, stillbirths, and weak kids/lambs that rarely survive the first week of life. These organisms are also zoonotic, which means they can transmit from animals to humans and cause infection.

The goal of an abortion work-up is to determine the cause, so that control and/or prevention strategies can be started in the herd/flock:

- vaccination for *Chlamydia*, *Coxiella*, *Campylobacter*
- nutritional changes (such as iodine supplementation for goiter)
- other management changes (limit herd introductions, appropriate biosecurity and disposal of infected fetal and placental tissues, prevent feed and water contamination by wildlife, cats, etc.)
- and remember, the cause of abortions can vary from year to year

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It is important to keep the fetus AND placenta for veterinary review/sampling in any abortion case. Make sure the placenta and fetus are as clean as possible and keep somewhere cool (refrigerate) and protected until your veterinarian arrives.

As many of the infectious agents causing small ruminant abortions are zoonotic, the following precautions should be considered to reduce the risk of contracting a serious disease:

- disposable gloves and sleeves should always be used when handling kids/lambs and placentas/birth fluids
- wash hands thoroughly with an effective disinfectant soap after contact with pregnant animals/birth products
- dispose of aborted fetuses and placentas appropriately (bag, bury, compost)
- pregnant women, children, the elderly or those with compromised immune systems should not have contact with aborted fetuses, placentas or birth fluids

The Use of Antibiotics to Control Infectious Abortions

As antibiotic use comes under greater scrutiny, there is a need to examine the evidence for the blanket use of antibiotics during or after an abortion storm. Laboratory identification of the infectious cause is critical to successful treatment and control. As we know, diagnosis can often take 72-96 hours to determine, therefore it can be a challenge for veterinarians and producers to not administer medications during that time period.

Within herds and flocks, *Chlamydia abortus* infection will continue to circulate from year to year due to the continued ability of infected animals to shed the bacteria in subsequent pregnancies. Antibiotic therapy will not eliminate the infection from herds that have had previous outbreaks but will help lessen further abortions from occurring in the middle of an abortion storm. To be effective, antibiotic therapy would need to be given to pregnant females having contact with the aborting dams, at around 95 days of gestation.

Campylobacter has a short incubation period and readily infects pen-mates of aborted does/ewes during an abortion storm. The two species of *Campylobacter* bacteria that cause abortions, differ in their response to antibiotics. *Campylobacter fetus* is generally susceptible to tetracycline. ***Campylobacter jejuni* isolates are routinely resistant to this class of antibiotics.**

Coxiella burnetii is another abortion-causing bacteria sensitive to tetracycline.

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Treatment often reduces the overall levels of abortion in the middle of an outbreak, however antibiotics do not reduce the level or duration of bacterial shedding¹.

It is important to remember that since *Toxoplasma gondii* is a parasite, abortions will not respond to antibiotics.

Traditionally, chlortetracycline medications have been added to feed in the last 30-40 days of gestation in flocks that experience abortion storms. **Evidence demonstrates this is unlikely to be an effective method of administration.** Research has shown that chlortetracycline fails to reach detectable limits in the placenta, amniotic fluid and fetal stomach contents in ewes fed 500mg/head/day chlortetracycline².

Injectable long-acting tetracycline may be a better choice. There is evidence that it reaches reasonable serum concentrations for 24 hours, but not 72 hours after a single injection³. The question remains whether repeated dosing is necessary to eliminate or prevent infection of the placenta. Timing of treatment in relation to infection and damage to the placenta is a challenge. As with any antibiotic, **milk and meat withdrawal times must be followed.** Testing a milk sample from treated does prior to selling is recommended to ensure there are no antibiotic residues remaining, thus avoiding inhibitor violations at the processing plant.

Key take-away: During an abortion storm, it is important to identify the cause of the abortion problem in order to treat correctly and effectively. This will minimize losses, and is also crucial to ensure antibiotics are used in a prudent and responsible manner. Discuss and develop an abortion protocol with your herd veterinarian.

References:

1. *Coxiella burnetii* infections in sheep or goats: an opinionated review. 2015. R. Van den Brom, E. van Engelen, H. I. Roest, W. van der Hoek, P. Vellema. *Vet Mic* 181: 119-129.
2. Pharmacokinetics of chlortetracycline in maternal plasma and in fetal tissues following oral administration to pregnant ewes. 2018. K. Washburn, V. R. Fajt, P. Plummer, E. Papastavros, J. F. Coetzee, L. W. Wulf, S. Washburn. *Journal of Pharmacology and Therapeutics* 41(2): 218-223.
3. Multiple-dose pharmacokinetics of long-acting oxytetracycline in *Brucella melitensis*-infected sheep. 1998. A. Mahasen, A. Radwan, Y. Iman, A. Zaghloul, I. Ahmed, B. Radwan, H. Zinat, C. Aly. *International Journal of Pharmaceutics* 160(1): 91-97.

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Prevention/Control of Infectious Abortions: Vaccine Options

Chlamydia abortus

“Chlamydia Psittaci Bacterin” manufactured by Colorado Serum Company. Administer subcutaneously high in the neck *60 days prior to breeding and repeat in 30 days*. Revaccinate annually just prior to breeding. Meat withdrawal 60 days.

Campylobacter fetus and jejuni

“Campylobacter Fetus-Jejuni Bacterin” manufactured by Colorado Serum Company. Administer subcutaneously in the fold of the skin behind the axillary space shortly *before breeding. Repeat in 60-90 days*. Revaccinate annually using a single dose. Meat withdrawal 21 days.

Coxiella burnetii

“Coxevac” manufactured by CEVA. Although not licensed in Canada, the vaccine is available from CEVA after having your herd veterinarian apply for a permit from the Canadian Centre for Veterinary Biologics (CFIA). Administer subcutaneously in the neck region *6 and 3 weeks prior to breeding*. Revaccinate annually. Meat withdrawal 60 days.

Antimicrobial Stewardship Resource

The Ontario Veterinary Medical Association in collaboration with ACER Consulting and the Ontario Ministry of Agriculture and Rural Affairs has developed an online resource to help livestock producers and veterinarians fight antimicrobial resistance. The initiative is called **Farmed Animal Antimicrobial Stewardship (FAAST)** and can be found at www.amstewardship.ca.

The website includes videos, podcasts and case studies all describing antimicrobial use and stewardship. There are online learning modules called FAAST Reviews. The modules available are:

Introduction to Livestock Medicines: This is an updated version of OMAFRA’s original livestock medicine course. Topics included are classes of antimicrobials, how they work, proper storage and administration.

Regulations on antimicrobial use and access: As of December 1, 2018, producers are no longer able to purchase antimicrobials unless prescribed by a veterinarian. This FAAST Review discusses veterinarian-client-patient relationships (VCPR) and other rules on antimicrobials.

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Steps to practice antimicrobial stewardship: This FAAST review highlights the 5 Rs of antimicrobial stewardship – responsibility, reduction, refinement, replacement and review.

There is a wealth of information on this website and dairy goat producers are encouraged to review the information by visiting www.amstewardship.ca or emailing info@amstewardship.ca.

Reminder – follow the label directions when using and storing your products

Phillip Wilman, Raw Milk Quality Program Coordinator, OMAFRA

A quick update and reminder that livestock medications, medicated feed and fly control products must be used and stored according to the label directions, and with an abundance of caution.

OMAFRA Raw Milk Specialists (RMS or inspectors) have witnessed odd incidents of milk contamination in the recent past, where the contamination came from unexpected sources. One producers' milk tested positive for sulfa antibiotic residue but had not used any sulfa on his lactating does. After considerable investigation by the inspection team, it was discovered that the producer was using a sulfa drug to medicate the milk replacer being fed to the kids. The pail used to transport the medicated milk replacer to the kids was being rinsed in the water trough used by the lactating does! Sulfa in the water consumed by the does was transferred to their milk. This is a good example of just how little antibiotic residue it takes to trigger a positive test result.

Another incident occurred when milking does opened the gate to their pen and found their way to the milking parlour. A fly control product had been placed on boards on the milking stand, and some of the goats consumed the poison. It was reported that a few of the animals exhibited signs of intoxication, staggering and incoherence, as well as lack of appetite and depression. All fly control products must be used and stored in a manner that prevents exposure to the livestock on the farm, in the case of granular fly baits, a bait station such as the ones pictured must be used.

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Other instances of contamination have occurred when does have escaped from their pens and accessed medicated feeds. Residues of feed medications such as decoquinate (Decoxx), monensin sodium (Rumensin) and lasalocid (Bovatec), as well as antibiotics, are prohibited from being in milk. As a producer, it is your responsibility to ensure that any milk that could be contaminated is not collected by your milk transporter. If you suspect that your animals may have been exposed to any substance which could alter the safety or quality of the milk, contact both your broker and RMS immediately. Milk collection may be delayed until your milk is tested and found to be clear of residues. This is a small price compared to the cost of a truck load of milk, which can be as high as \$50,000.



Examples of approved granular fly-bait stations

Dairy plant licence issued to Canadian division of Feihe International Inc.

Rick Bond, Food Safety Advisor Dairy, OMAFRA

On October 11, 2019 OMAFRA issued a dairy plant licence to Canada Royal Milk ULC (CRM). Located at 1680 Venture Drive, Kingston, Ontario, CRM is the Canadian division of Feihe International Inc., a Chinese based multinational company that specializes in the manufacture and sale of formulae powders for infants, young children and adults. CRM plans to manufacture using both cow and goat milk from local supply chains. Most of the product will be for the export market to China and other southeast Asian countries, but CRM will be looking to develop nutritional products for the North American market as well.

The 320,000 sq. ft. CRM facility was an investment of over \$225 million and utilizes the most current technology in the industry today with separate cow and goat milk



Facility at 1680 Venture Drive, Kingston, ON

processing lines. Production startup will be in phases with Phase I being cow milk processing and Phase II goat milk processing. Cow milk will be supplied by Dairy Farmers of Ontario and CRM is planning to source goat milk primarily from Ontario, which will help to improve and strengthen both cow and goat milk production in Ontario.

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Staff from OMAFRA's Dairy Program have worked closely with CRM during the entire construction of the new facility to ensure that it met all the provincial regulatory requirements for licensing. In addition, CFIA and Health Canada are also working closely with CRM to ensure they meet all the requirements for federal licensing for export.

Tips for Winter Kid Barn Environmental Management

Marlene Paibomesai, Dairy Specialist, OMAFRA

As the weather turns to cooler temperatures and snow is on the horizon, the attention of dairy goat producers' turns to winterizing the barn to keep a favourable temperature for the kids. The overall goal is to keep the area draft free and dry. When the barn is closed-up this can cause a rise in relative humidity and barn gases, as ventilation and introduction of fresh air is limited. The following article has some tips and tricks for managing a barn environment through the winter.

Understanding some key concepts will help with making decisions on winter ventilation and the environment you are attempting to optimize for your goat kids. In general, one should strive for 4 air changes per hour in the barn in the winter. This allows for the introduction of fresh air into the barn without creating a draft (air speeds above 60 feet per minute or 0.3 meters per second).

A thermoneutral zone are temperatures where an animal does not have to change its current metabolic state in response to temperature. In other words, the goat does not have to expend energy to keep warm or actively cool. Keeping goat kids in the thermoneutral zone can improve growth and health. The thermoneutral zone of a goat is between 12-24°C.

In the winter it can be a challenge to keep barn temperatures reasonable while introducing fresh air. When the barn is tightly closed-up there can be a reduction in fresh air introduction that can decrease air quality in the barn either by increasing relative humidity or through barn gas accumulation. One can consider adding additional heating to keep the temperature close to the thermoneutral zone while still being able to introduce fresh air.

Bacterial growth is encouraged in areas that are above 75% relative humidity. In very humid buildings you can get an excess buildup of moisture in the barn. Keeping the

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area dry is essential to reducing the bacterial growth. The source of this moisture can come from a few different sources including the animals, wet bedding, and power washing. Strategies to reduce relative humidity in the barn include introduction of outside air, changing bedding regularly, and mixing the air in the room to reduce the overall relative humidity.

Gas production is common in livestock barns. Barn gas concentration can build up over time in an area that is not properly ventilated. Common barn gases include ammonia (NH_3), carbon dioxide (CO_2), methane (CH_4), hydrogen sulfide (H_2S), and carbon monoxide (CO). Barn gases present at low concentrations can irritate the upper respiratory tract and cause coughing and watery eyes. Long-term low concentration gas exposure may lead to increased respiratory infection. High concentration exposure can cause more significant health impacts and possibly death. Each type of gas has a time-weighted exposure limit that is recommended for workers that are exposed to these gases at the work place. For livestock there is little information on the long-term exposure limits and how this might impact production. The following table reports the human time-weighted and short-term exposure limits. Exposure limits for animals is assumed to be around the same exposure limits for humans. One thing to keep in mind is that these animals are exposed 24 hours a day.

Common Barn Gas ³	Human Time-Weighted Average Limit ¹	Human - Short Term Exposure Limit ²
Ammonia (NH_3)	25ppm	35ppm
Carbon Dioxide (CO_2)	5,000ppm	30,000ppm
Hydrogen Sulfide (H_2S)	10ppm	15ppm

¹ Average Concentration in the air over 8-hour workday or 40-hours per week

² Average concentration in the air over 15 minutes and should never reach or exceed this threshold

³ Current Occupational Exposure Limits for Ontario Workplaces Required under Regulation 833 accessed at labour.gov.on.ca/english/hs/pubs/oel_table.php

There are two options for reducing the concentration of barn gases: 1) reduce or eliminate the source that is producing the gas or 2) ventilate the gas out of the barn. Sources of ammonia, carbon dioxide and methane include urine, manure, cleaners and the animals themselves. In most cases, routine cleaning of the pens and properly designed ventilation should keep these barn gases at a reasonable level. Purchasing

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monitors can help you determine whether your barn is providing a favourable environment for your animals or if changes need to be made to the system.

Tools you can use to monitor the environment:

- Thermometer
- Battery Operated Temperature and Relative Humidity Sensors
- Battery Operated Barn Gas Sensors
- Wind speed monitors

All these tools are available for purchase online and are easy to operate. When setting up these monitors, be sure that you are measuring at different times during the day and always measuring at animal level. These monitors can draw lots of interest from the animals and are vulnerable to being chewed on. If you are installing directly in the pen be sure to either put a cage around the sensor or section off an area of the pen that limits the animals from touching the sensors. Recent work has shown that in-pen experience can be different compared to other areas in the barn. A few of these tools are available with the ability for recording over longer periods of time if interested in determining any trends.

For more information on barn gases and ventilation visit ontario.ca/livestock.

Goat Genomics and Genetic Improvement Update

Erin Massender (UoG) & Marlene Paibomesai (OMAFRA)

Researchers at the Centre for Genetic Improvement of Livestock at the University of Guelph and the Canadian Centre for Swine Improvement continue to work on a project aiming to implement genomic selection for the Canadian dairy goat industries. This project is funded by the Ontario Agri-Food Innovation Alliance, a collaboration between the University of Guelph and Ontario Ministry of Agriculture, Food and Rural Affairs.

What is Genomics?

Genomic selection utilizes thousands of small differences in an animal's DNA, called single nucleotide polymorphisms, to predict its genetic merit. Genomic selection has revolutionized livestock breeding programs around the world by allowing producers to make more accurate selection decisions for animals at an earlier age, which increases the rate of genetic gain and can decrease costs associated with rearing unproductive

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replacement animals. To do this, the researchers are building a genomic reference population, which is a group of animals that have phenotypes (i.e. milk records, classification scores, CAE testing status) and have also had a small tissue sample tested to determine their genotype at over 50,000 locations across their DNA. The genomic reference population will be used to determine what regions of the DNA are associated with economically important traits, such as milk production, which will then allow selection of breeding candidates based on their DNA even if they do not yet have performance records for the trait of interest!

Goat Genome Project

In this project, dairy goat producers from all across Canada have been recruited to provide tissue samples (i.e. nasal swabs, ear hole punches, and blood) from animals in their herd. To qualify to participate in this project, herds must have registered Alpine and/or Saanen goats and participate in a milk recording program. The 12 herds currently enrolled in the project are located across Canada, all the way from British Columbia to Nova Scotia, and samples from 612 Saanen and 441 Alpine goats have been collected to date. The goal of the project is to genotype approximately 1,400 to 1,500 goats in total. Although, sample collection for this project is almost complete, herds will continue to be enrolled while supplies and funding are available. Sample collection supplies, shipping, and genotyping costs, which together cost about \$100 per animal, are paid for by the project. If you are interested in more information about participating, please contact Erin Massender by email at emassend@uoguelph.ca or by phone at 519-365-1013.

Update on the Goat Genome Project

Genotyping results have been received for 672 of the 998 samples submitted to the lab to date. The results are very promising, as 99% of the samples had sufficient DNA quality and quantity to be successfully genotyped, indicating that nearly all submitted samples will be able to be used to expand the genomic reference population. The researchers are just beginning to analyze the new genotypes but have been optimizing the prediction of genetic merit for milk production traits using genomic information on 720 animals collected during a previous project. Preliminary results suggest that the benefits of selection using genomic estimated breeding values compared to traditional estimated breeding values, in terms of gains to selection accuracy, is trait dependent. In other words, some traits will benefit more from genomic selection than others. In general, gains in selection accuracy were greatest for most traits when Alpine and Saanen animals were

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analyzed separately. This suggests that the breeds are not similar enough for a successful cross-breed analysis, so the breeds will be analyzed individually in the future.

After the genomic breeding value prediction methodologies are optimized for milk production traits, researchers will estimate genomic breeding values for type traits, and then aim to investigate the regions of the DNA that are associated with some novel health and productivity traits, including resistance to Caprine Arthritis Encephalitis Virus (CAEV).

In addition to this project, the Goat Value Chain Roundtable (GVCRT) Genetic Improvement and Herd Management Sub-Committee is also working on a survey to understand what your needs are as a dairy goat producer in terms of genetic improvement and breeding. We are looking for your input as to what you would like to see for your herd in terms of genetic improvement and what information you are currently collecting on farm. Stay tuned over the winter months for the survey which will be available online and by mail. In addition to this we will also be hosting focus groups to better understand barriers and opportunities in goat genetic improvement in Ontario. We look forward to your participation and hearing from you. If you are interested in viewing the most recent estimated breeding values for dairy goats across Canada visit Goatgenetics.ca.

Dairy Goat Cost of Production Project: Coming in 2020

Marlene Paibomesai, Dairy Specialist, OMAFRA

Benchmarking cost of production is an important task on any farm. Cost of production information offers the ability for producers to determine key areas to improve their business and drive profitability. Previous cost of production work in the goat industry showed large farm-to-farm variation in the cost of producing a litre of goat milk. Considering the importance of this information for current dairy goat producers, prospective producers and the dairy goat industry, OMAFRA has secured funding for a two-year cost of production benchmarking project through the Canadian Agriculture Partnership. The Canadian Agriculture Partnership is a five-year federal-provincial-territorial initiative to strengthen the agriculture and agri-food sector. In 2020 there will be a call for farms to participate in the Dairy Goat Cost of Production Project. Stay tuned for more information on how you can participate.

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The Dairy Goat Digest is a newsletter published by the Food Safety Inspection Delivery Branch with input from specialists across the Ministry.

To receive an electronic copy of the Digest, please contact the Agricultural Information Contact Centre (AICC) at:

1-877-424-1300 or ag.info.omafra@ontario.ca

For more information on Goat Milk Quality and Procedures, visit the OMAFRA website at: www.ontario.ca/bw9x