COLOSTRUM MANAGEMENT FOR COMMERCIAL GOAT PRODUCTION

Success from the start!





What is colostrum?

Colostrum - rich in nutrients and immune properties - is produced by the doe's udder in late pregnancy so it is available to the kids as soon as they are born.

Colostrum is comprised of several important components: protein—serving as a long-term energy source; fat and lactose — serving as short-term energy sources that also help maintain body temperature; fat-soluble vitamins that do not cross the placenta like Vitamins A, D, and E that play a role in bone development and immune response; and immunoglobulins (IgG), antibodies to help newborn kids fight pathogens (viruses and bacteria). Once the doe kids, she starts to produce milk and the colostrum becomes diluted and contains fewer immunoglobulins than right at kidding. Goat kids, unlike human infants, are born without any antibodies and rely totally on the colostrum feeding in the first day of life for disease protection.

Why is colostrum necessary?

Colostrum is produced by all mammals to protect the newborn animal from environmental pathogens and to provide adequate energy. Best fed in the first hour of life, once colostrum is consumed the antibodies are absorbed through the small intestine into the blood stream. At birth a kid's immune system is weak and it takes several weeks to become strong enough to defend against disease. Until then, the colostral antibodies are the kid's main source of defense against bacteria and viruses. Inadequate colostrum quality and quantity can leave the kid open to infection from almost any opportunistic pathogen. Failure of passive transfer of immunity (FPT) is the term given to a newborn animal that has not received adequate immunity from the colostrum consumed.

Sourcing colostrum

- Industry experts recommend that pooled colostrum NOT be fed to kids because it has the potential to spread disease. The risks associated with using pooled colostrum far outweigh the added advantage of immuno-protection from multiple-source does. Immunoglobulin levels would be average at best.
- If a colostrum shortage occurs, ensure the source farm is of similar or superior disease status. Diseases of concern include Caprine-Arthritis-Encephalitis (CAE) and Johne's disease.

There are tests available through your veterinarian to check disease status.

 Commercial colostrum replacement products are of bovine origin, which may impact their effectiveness in building antibodies. They also do not contain antibodies against the "farm bugs" and likely the donor cows have not been vaccinated against diseases of concern in goats (e.g. pulpy kidney).



Handling fresh colostrum

Collecting colostrum

- Wear clean latex/nitrile gloves before collecting colostrum.
- Wipe the teats and then the udder with a clean cloth to ensure the colostrum will not be contaminated by debris and bacteria. Teats should be sanitized and dried, using a clean cloth or paper towel.
- Ensure that the colostrum container is clean and dry.
- Using proper milking techniques, collect colostrum within 15 minutes of kidding (only first-milking colostrum should be collected for use in newborns).
- Heat-treating or chemically-treating colostrum for disease prevention or to prevent bacterial growth should be done immediately after testing colostrum quality using a colostrometer.



Colostrum quality

- Colostrum from the doe's first milking immediately after kidding must be the only colostrum fed to kids. Milk taken a few hours later does not contain sufficient antibodies to be protective and the colostrum has become more diluted with milk.
- Colostrum should be thick, yellow and smooth think of melted vanilla ice cream. Using a colostrometer calibrated for use in goat's milk will help you gauge colostrum quality.
- Any appearance that mastitis may be present, e.g. clots, a bloody or serum-like appearance to the milk, or an abnormal colour, indicates that the colostrum is of poor quality.
- Blood testing is available to measure immunoglobulin levels in kids from six hours old up to one week of age. This will assist you in measuring the effectiveness of your colostrum management protocol, and possibly offer insight into late pregnancy nutrition and kid mortality and morbidity.
- Bacteria in colostrum restricts the uptake of immunoglobulins in the small intestine, and can become a source of infection in young kids.





Note: Having quality colostrum starts with a good nutrition plan for lategestation does. Does that do not have ideal body condition scores at the time of dry-off may have difficulty generating good quality colostrum for the kids they carry. Working with a herd nutritionist will help you make informed choices about feeding during the transition period, which is the three weeks leading up to and following kidding.

Treating colostrum for disease control

- Heat-treating colostrum can be an effective method to help control major production-limiting diseases such as Johne's disease and CAE.
- The process to heat-treat colostrum is very specific and labour intensive. Follow guidelines carefully for best results:
 - On the stovetop using a water bath, heat water to a maximum of 60°C (ideal temperature is 56°C).
 - Carefully place the colostrum container into the water bath.
 - Using a thermometer, ensure that the colostrum reaches 56 to 60°C.
 - Maintain this temperature for 60 minutes.



Heating to a temperature below 56°C will allow the pathogens to survive. Heating to over 60°C will cook the colostrum, killing the antibodies. Heat-treating colostrum will reduce, but not eliminate, Johne's-causing bacteria.



Storing colostrum

Refrigeration

Fresh colostrum can be refrigerated without degrading for up to 48 hours. The internal fridge temperature should be between 1 to 2°C.

Freezing

Freezing colostrum should be standard practice on the dairy goat farm for situations when colostrum is in short supply. When freezing colostrum, it is recommended to package it in 250 mL portions in either bottles or freezer bags for quick thawing and ease of use. Frozen colostrum is best used within six months. Freezer temperature should be –20°C. Frost-free freezers are NOT recommended for long-term storage because of their freeze-thaw cycles.



Label every colostrum container with the date and the donor doe's identification or management number.



Do not leave colostrum at room temperature or in open containers and pails as bacterial counts double every 20 minutes.



Thawing colostrum

- Colostrum should be thawed in a warm water bath around 50°C.
- Colostrum should NOT be thawed at room temperature.
- Mixing colostrum thoroughly during thawing will ensure that there are no hot spots or frozen pieces remaining.

Note:

Never thaw colostrum in the microwave. This practice kills the antibodies, making the colostrum ineffective.

Colostrum timeline



Feeding kids colostrum

- An average kid weighs approximately three kilograms (kg) at birth. Feeding recommendations in this section are based on this weight. The general rule for feeding colostrum is 50 mL per kg of bodyweight four times within the first 24 hours of life e.g. five per cent of its body weight immediately and 20 per cent in the first 24 hours. These recommendations apply to both doelings and bucklings.
- For example, for a three kg kid: using only good quality colostrum, feed 150 mL within the first hour if possible, but no later than six hours after birth (the earlier the better).
- If the dam's colostrum is of insufficient quality because of illness or mastitis, thaw colostrum saved from another doe to feed kids.
- Continue feeding transition milk for three days as it is very rich in nutrients and energy that will benefit kids.

Note:

Avoid feeding too much colostrum in a single feeding. The sooner the kid has colostrum, the better. If the kid is too weak to drink, use an esophageal tube (instructions can be found on Ontario Goat's "*Hypothermia and hypoglycemia in kids*" poster).



Bottles, buckets and nipples

Bottles, buckets and nipples should be washed using soap and hot water (80°C). They should then be rinsed with a 10 per cent bleach solution. After cleaning, let the bottles, buckets, and nipples dry before the next use to reduce bacterial load. Stacking buckets together can re-introduce bacteria and promote bacterial growth – avoid this practice whenever possible.



Bottles and buckets with cuts, grooves or scratches on the inside should be discarded, as these are an ideal environment for bacterial growth.



Antibody absorption

From this graph, you can see the importance of getting the colostrum into kids as soon as possible. By 24 hours of age, the kid's ability to absorb antibodies has diminished. This decline starts 30 minutes after birth, which stresses the importance of feeding kids colostrum shortly after they are born.



The mighty immune system

Given the correct colostrum quality and quantity, the kid's immune response will resemble the graph below. Kids are at risk for sickness up to five weeks of age. At this time, kids are starting to activate their own immune system rather than relying on the immunity gained from the colostrum.



COLOSTRUM MANAGEMENT FOR COMMERCIAL GOAT PRODUCTION



Ontario Goat wishes to thank all those who contributed to this important industry initiative. Your expertise and willingness to help are greatly appreciated.

Project contributors: Ontario Goat staff Dr. Jocelyn Jansen, Ontario Ministry of Agriculture, Food and Rural Affairs Dr. Paula Menzies, University of Guelph

Photographs:

Courtesy of Dirk Boogerd and Kendra Keels, with an additional thank you to all the farms and businesses that helped with the photography for this project.

©2015 by Ontario Goat

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means -- graphic, electronic or mechanical, without the prior written permission of the publisher. Any request for photocopying, recording, taping or imputing into information storage and retrieval systems of any part of this book shall be directed in writing to Ontario Goat, 449 Laird Road, Unit 12, Guelph, Ontario, N1G 4W1.

The Ontario Farm Innovation Program is funded through *Growing Forward 2 (GF2)*, a federal-provincialterritorial initiative. The Agricultural Adaptation Council assists in the delivery of *GF2* in Ontario.







Canada