The Small Ruminant Scoop Newsletter

Ministry of Agriculture and Food
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Ontario

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Welcome to The Small Ruminant Scoop. This virtual newsletter is intended to provide current information and research, as well as topics of interest for the small ruminant producer. With views on nutrition, breeding, animal health and production, it will encompass the various commodities of the small ruminant industry.

In this issue:

Animal Welfare:

Winter shelter for Sheep

(Craig Richardson, OMAF Animal Care Specialist)

Professor Egil Berge summarizes 30 years of research on housing of sheep in cold climates. Comparisons are made between the different housing types based on production performance. System designs for humid-cool climate and dry-cold climate are examined.

Generally sheep can live without a building. The lower critical temperature (LCT) for full fed, acclimatized dry ewes with long wool in calm air indoors is –40 C. Being below LCT animals must increase heat production and use more maintenance feed to maintain their body temperature. Outdoors, sheep will shield each other by huddling together and will seek shelter from the wind. Factors that raise the LCT:

- Rain or wetness of fleece (wet bedding)
- Short fleece or fleece with much tag and/or matting
- Wind speed

Dry, well-fed sheep thrive and produce well on slatted floors even when the outside temperature is –40 C or lower. Sheep barns require no insulation. Berge concludes with a discussion of whether sheep housing at all is economically justifiable.

Source:

Berge, E., 1997. *Housing of sheep in cold climate.* Livestock Production Science 49, 139-149.

Reproduction News:

Kidding rates of goats affected by low body energy reserves under range conditions of northern Mexico.

(Craig Richardson, OMAF Animal Care Specialist)

Body condition of goats under range conditions was not a risk factor for getting them pregnant. Does with a body condition score (BCS) under 1.5 (on a 5 point scale) however, were 9 times more likely to abort compared to all other does. A doe with low energy intake at time of

conception was half as likely to kid as compared to does consuming higher energy feed.

It appears goat does respond to the presence of the buck even when they have low body energy stores. Low BCS did not have a negative effect on conception rates. Once pregnant the does either abort or keep the pregnancy to full term depending upon feed quality and availability. The effect of BCS at mating on abortion rates was less as BCS increased. Researchers concluded, to maintain pregnancies in goats kept under range conditions, BCS at mating must be above 2.

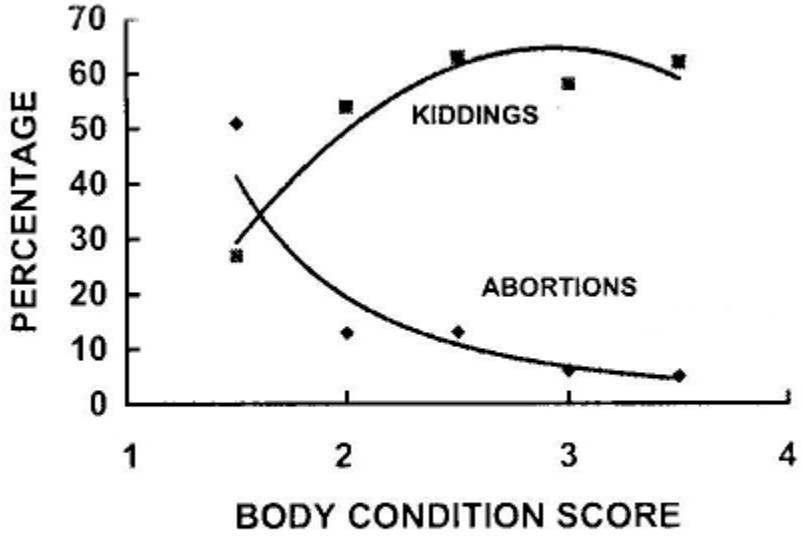

Fig. 1. Relationship between body condition score of goats at mating and abortion and kidding rates.

Source:
Mellado, M., Valdez, R., Lara, L.M., Garcia, J.E., 2004. Risk factors involved in conception, abortion, and kidding rates of goats under extensive conditions. Small Ruminant Research 55, 191-198.

Animal Health:

Should I try copper oxide wire particles to control parasites in my lambs and sheep?

(Kim Klotins, OMAF Antimicrobial Resistance Specialist)

Quite frankly, no! Recently there has been some press announcements regarding the use of copper oxide wire particles (COWP) (sometimes called 'needles') to control *Haemonchus contortus* (Barber pole worm) infestations in lambs and sheep rather than more familiar dewormers, such as Ivomec® (ivermectin injectable). COWP is touted as an alternative to use if resistance of worms to standard dewormers is occurring. However, sheep producers in Ontario should beware!

Here's what you need to know:

1. **The product is not registered for use in Canada**. You will not have assurances that any unapproved product you purchase is efficacious and safe to use in sheep in Canada.
2. **Copper toxicity can be a problem** in lambs and sheep in Ontario [see http://www.gov.on.ca/OMAFRA/english/livestock/sheep/facts/sheep_health_copper_info.htm]. The label claim for Copinox is for prevention of copper deficiency. Copper deficiency is not a problem in Ontario.
3. **Research on parasite control with COWP has not been conducted in Ontario**. Research has been reported on hairy sheep (southeastern USA), Merino sheep (Australia) and sheep in New Zealand. The results are not directly applicable to Ontario breeds of sheep. Living and management conditions are also very different for sheep in Ontario compared to sheep in southern USA, Australia and New Zealand.
4. **COWP is not 100% effective**. COWP reduces (but does not eliminate) fecal egg counts and worm counts for the Barber pole worm in the abomasum (stomach). There is no reduction in the small intestine. In addition, the reduction in counts does not occur in all lambs (at least in those given 2 grams of COWP or less).
5. **COWP is not effective against other worms**.
6. **Safety of COWP has not been adequately evaluated**. Higher doses (4 or 6 grams) given to 4 to 6 week old lambs did increase liver copper levels above the normal range during the study although clinical signs of copper toxicity were not seen. Label information for Copinox recommends that COWP should not be given to pre-weaned lambs, lambs less than 10 kg in weight, housed sheep or breeds susceptible to copper toxicity.
7. **Health, growth, feed efficiency and economic outcomes have not been adequately evaluated**. One study on hairy sheep suggests that COWP given to pregnant hairy ewes one month prior to lambing twins results in smaller lambs at birth and at slaughter. The label claim for Copinox recommends dosing at tupping or during first pregnancy. Dosing in the second or third month of gestation is only recommended if copper deficiency is severe.

Research Notes:

Eating Quality of Australian Lamb to Become More Consistent

(Delma Kennedy, OMAF Sheep Specialist – Genetics, Reproduction and Performance Programs)

Meat and Livestock Australia have completed extensive research on the eating quality of sheep meat and the best practices to ensure that eating quality is optimized and maintained from farm to fork. Recommendations for producers include:

- Lambs should be on a diet that allows them to gain weight right up to slaughter.
- There should be as short a time as possible between when the animals are sorted for market and slaughter.
- Optimum time to slaughter after arrival at the plant is 0 – 24 hours for heavy lambs to minimize carcass weight loss and meat pH problems.
- Dehydration of lambs should be avoided during the sorting, transportation and holding periods. At temperatures over 25°C lambs should have access to water to avoid reduction in muscle weight and meat that is darker than usual.

It is well established that the time and process from stunning to chilling is extremely important and perhaps the most important in producing good quality meat. Ideally, a carcass will enter rigor (pH 6) when the carcass is 15 – 20 °C. Hanging method, aging period and storage temperature are inter-related and can be adjusted to ensure good eating quality. The following table from Meat and Livestock Australia shows recommendations for processors to ensure good eating quality depending on the length of time to market.

Processing Recommendations from Australian research for optimum eating quality

	Short time to market	Medium time to market	Long time to market	Frozen
Hanging Method	Achilles	Achilles	Achilles	Achilles
Electrical stimulation needed	Yes	Yes	No	Yes
Enter rigor (pH 6) at:	18 – 25°C	18 - 25°C	8 - 18°C	13 - 23°C
Minimum ageing period	5 days	5 days	10 days	5 days before freezing
Storage temperature	1°C	1°C	-1°C	1°C then -18°C

In November 2004, Meat and Livestock Australia announced that Australian processors were in the process of adopting some of the new research information and technologies developed in this project. It was reported that use of electrical stimulation of sheep and lamb carcasses has been uncommon but the Australian Sheep Industry Co-operative Research Centre will be working with 11 processors to implement electrical stimulation into their plant process. Electrical stimulation reduces the variation in tenderness between carcasses. It also allows the abattoir to chill carcasses more rapidly without the risk of causing tough meat.

The Science Behind the Smell

(Vanessa Taylor, OMAF Milk Quality Specialist)

A study was published recently that explained some of the chemistry responsible for the differences in smell and flavour for cow, sheep and goat milk. The culprit for species related flavours in milk is due to a group of compounds called conjugated alkylphenols. There are 3 types of conjugated alkylphenols that contribute to the flavour profile in milk, but one stood out as having the most influence on flavour (ethylphenols). This compound was found most abundantly in goat milk. Cresols also influence flavour, and this was found to be smallest in cow's milk. Researchers attributed the animal or barny flavour found in goat and sheep milk to this compound. Phenols were present in very small amounts, with sheep milk having the largest concentration, however it was labeled as providing only a small influence on milk flavour.

Table 1: Conjugated alkylphenol profiles of skim milk from different ruminant species

Conjugate compound	Sheep (ppb)	Goat (ppb)	Cow (ppb)
3- & 4-ethylphenols	11.5	87.8	17.4
p- & m-cresols	206	184.4	98.6
Phenol sulfate	2.2	<0.02	<0.02

ppb: parts per billion

The biggest influence that this study found that affected the concentration of these compounds in different species' milk was breed, feed sources, and variation in individual animal metabolism of alkylphenols. All these things combined can make milk within a species differ as well if management and breeds are also different.

Source:
Kilic, M., R.C. Lindsay. *Distribution of Conjugates of Alkylphenols in Milk from Different Ruminant Species*. Journal of Dairy Science, 2005, 88:7-12.

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