Do Your Katahdin Ewes Differ in Parasitic Worm Load at Lambing? Is the Difference Important?

Jim Morgan, Arkansas Katahdin Breeder

Breeders select animals for many reasons including performance, conformation, shedding, reproductive soundness and parasite resistance. Many of us have used fecal egg counts and/or FAMACHA® (eye lid color scores) of young lambs (45 to 180 days of age) to help identify animals that are resistant (low nematode fecal egg counts) or resilient (bright red eye lids). Some breeders have also used FAMACHA® scores to evaluate ewes.

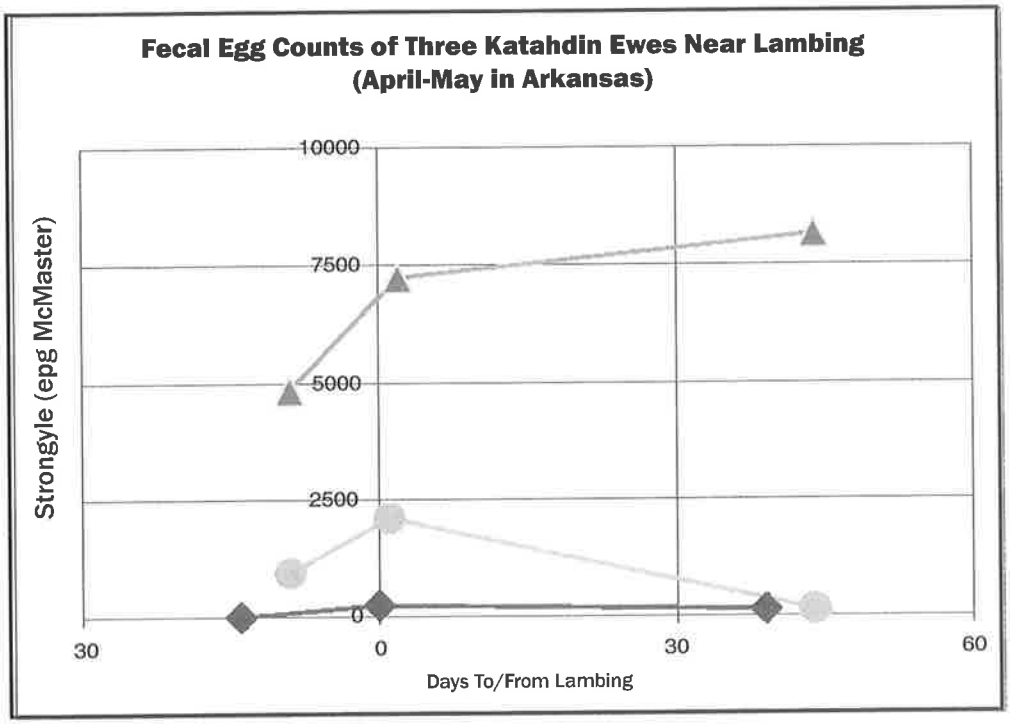
In terms of managing parasites, researchers for many years have identified two classes of sheep that are more susceptible to parasitic nematode worms: young lambs and the ewe during late gestation and lactation (periparturient). In general, adult sheep are more resistant and resilient to parasite worms, except for the periparturient ewe. Nutritional stresses of gestation and lactation coupled with a depression in the immune system during the periparturient period can result in increased fecal egg counts (FEC) in the ewe.

In more northern temperate areas where snow prevents grazing and ingesting of larval worms in the winter, the nematode larvae overwinter in the ewe in an arrested/hypobiotic (like hibernation) state in the wall of the gut, then mature during late pregnancy and early lactation. The mature worms start laying eggs during the spring, when temperatures are more conducive to larvae being ingested by grazing sheep, especially the young lambs. It is this source of worm eggs from the periparturient ewe in the spring that is believed to start the cycle of increased worm larval load in the pasture. In southern humid climates, in which sheep graze year around, there are some levels of reproductively-active parasitic worms year around. Periparturient ewes that are less resistant to parasitic worms are surely adding significantly to pasture infestation.

The impact of individual periparturient ewes on pasture worm contamination is less well known. For the last 30-40 years, research in the periparturient rise was less important as animal health professionals advocated the use of dewormers (anthelmintics) in the fall and/or just prior to lambing to prevent the periparturient worm rise in the ewe. In flocks that have nematode worms that are resistant to dewormers, the ability to pharmaceutically minimize the periparturient worm rise is a less viable option. If shepherds produce a natural/organic lamb product, use of dewormers is also not available.

Dr Charles Parker, KHSI Honorary Member and Director Emeritus of US Sheep Experiment Station, has long advocated selecting ewes that do not show a periparturient rise in FEC and selecting lambs that are also resistant to worms (low FECs). Several Katahdin breeders who participate in the National Sheep Improvement Program (NSIP) participate in a project to identify rams, ewes and lambs that are genetically resistant to parasites as lambs. These Katahdin breeders receive rankings of parasite resistance of their sheep. In response to Dr Parker's urging, several Katahdin breeders are evaluating ewe resistance to parasitic worms during the periparturient period. Kathy Bielek (KHSI member in OH; see Katahdin Hairald Spring 2008 for interview) received a USDA-SARE (US Dept of Agriculture, Sustainable Agriculture Research & Education) grant to investigate the periparturient rise in FEC in the ewe. Dr Joan Burke, USDA-ARS (Agricultural Research Service) is also coordinating an investigation of worm loads in periparturient Katahdin ewes.

Preliminary evidence indicates that Katahdin ewes can show a wide range in FECs during late gestation and early lactation (Evidence includes data presented by Kathy Bielek (OH) at the KHSI 2008 Expo in Maryland and communications from Dr Joan Burke, USDA-ARS, Booneville, AR)



In the example in Figure 1 (J Morgan farm), all three ewes had acceptable FAMACHA scores (eyelid color indicating no need for deworming), but were contaminating the pastures at very different rates. One ewe started at 4500 eggs/gram (epg) prior to lambing and rose to over 8000 epg. Another ewe ranged from 0 epg to 250 epg during the periparturient period. Clearly, Katahdin ewes can differ in their resistance to parasitic worms during the periparturient period. While Figure 1

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only shows three ewes, over 140 ewes have been evaluated (Bielek in OH, Morgan in AR, Dr Burke's USDA-ARS flock in Booneville, AR).

We can start to answer the questions in the article title. a) *Do your Katahdin ewes differ in worm parasite load at lambing?* Answer: Yes, preliminary results indicate that Katahdin ewes can have large differences in worm load at lambing. b) *Is the difference important?* The differences in FEC at lambing (such as those seen in Figure 1) could be large enough to be of considerable management importance. At this point, researchers do not know how much of the difference in FEC during the periparturient period is genetic and how much is environment (nature versus nurture). If 95% of the difference is environment and only 5% is heritable, it will be very hard to select for genetics to decrease the periparturient rise. If 40% of the difference in the periparturient rise is heritable, it will be much easier to make genetic improvement and identify ewes that are resistant to worms during gestation and lactation. At the least, shepherds can choose management methods that minimize the FEC load in lambing ewes. Quality nutrition is one management approach that should decrease survival of worms in the ewes.

In the next few years, several of us hope to identify ewes with repeatedly low fecal egg counts during the periparturient period and determine if this trait is heritable. It will take the collaboration of several breeders and agricultural scientists.

The author thanks all the breeders that are participating in the project (Kathy & Jeff Bielek of OH; Milledge & Roxanne Newton of GA; Donna Stoneback of PA; Sue & Dave Ingram, MO) and the researchers (Dr Joan Burke, USDA-ARS of AR, Dr Jim Miller of Louisiana State University Veterinary Medical School and Dr Dave Notter of Virginia Tech). The author also thanks Dr Charles Parker, Ohio State University Emeritus and Dr Bill Shulaw, Ohio State University for their advice and encouragement.