Evaluation of Katahdin and Wiltshire Horn (Hair Sheep Breeds): Their Effectiveness in Low Input Management Schemes.

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Objectives:

1. Evaluate production parameters of two hair sheep breeds (Katahdin and Wiltshire Horn).

    a. growth to weaning

    b. feedlot gains

    c. carcass characteristics

2. Investigate propensity for fall lambing in hair breed females.

3. Determine generations required to "breed the wool off" conventional sheep breeds.

4. Compare economics of "wool less" sheep and wool producing breeds.

5. Establish semen and embryo inventories for different hair and hair x wool cross populations.

Justification:

U.S. sheep numbers are currently at an all-time low of 7.2 million head. This is the lowest total since census numbers of sheep have been kept (USDA, 2000). World wool supply remains extremely high and a subsequently low price is being realized for wool. In many cases, wool stores are simply being warehoused because of the extremely low market prices. Many sheep producers are finding it impossible to cover shearing costs from the total revenue received from the wool clip. This is in severe contrast to the situation fifteen years ago when approximately one-third of the total revenue from sheep in the United States was obtained from wool receipts (USDA, 1984).

Some of the decline in numbers can be attributed to a decline in the amount of and the high cost of labor involved at specific times in a sheep operation. Hair sheep breeds seem to have potential in establishment of low input, less labor intensive sheep programs which can complement other farm and ranch enterprises.

Background – Katahdin Sheep Breed:

Work on establishment of the Katahdin breed started in 1957 through the efforts of Michael Piel of Maine. Three "African Hair Sheep" were imported from St. Croix and crossed with several breeds which existed in the United States at that time. The Wiltshire Horn influence was added in the 1970's (Katahdin Breed Assn., 1999).

Katahdins are described in the breed literature as hardy, adaptable, low maintenance sheep. They do not produce a fleece and, therefore, do not require shearing. Most animals are white, but can also be tan or multi-colored.

Other traits which seem to offer potential from the Katahdin include resistance to parasites, potential for accelerated or out of season lambing, and acceptable fertility. Katahdin sheep did, however, exhibit lower average daily gain than some other breeds (Wideus, 1997).

Background – Wiltshire Horn:

The Wiltshire Horn is an ancient British breed from the Chalk Downs region of England. Both rams and ewes are horned, but a polled line has been established. Both sexes are white with occasional dime-sized black spots on the undercoat. They are described as medium sized sheep that do well in either heat or cold. Current interest is due, in part, to their lack of wool and need for shearing (Thwaites, 1993).

There has been no research done to characterize the Wiltshire Horn for their use in American production schemes. Their value may come from not only their lack of wool, but also from resistance to external parasites, foot rot resistance from a black hard hoof, and lamb vitality. They, however, are probably suspect in growth rate. They are also said to be seasonal breeders and somewhat late in maturity.

Procedures:

The ewe flock used at the Ekre property for leafy spurge grazing demonstrations will be divided; one group bred to a Katahdin ram, another group to a Wiltshire Horn ram, a third group to Columbia and Hampshire rams.

Breed of sire effect on lamb birth weights, weaning weights, and feedlot gains will be measured. Male lambs will be evaluated for carcass traits. Female lambs will be kept as flock replacements and evaluated over three to four years for puberty, out of season lambing ability, and reproductive performance. Economic impacts of wool versus no wool will be evaluated.

Results:

Results of lambing are given in table 1. All groups had high lambing percents. Death losses were greatest in the Columbia and Hampshire sired lambs. There is no particular explanation for this. As expected, these lambs were heavier at birth than were the hair-sired lambs. All hair-sired lambs showed exceptional vigor at birth. Again, this was to be expected because of the heterotic affect on vigor.

Table 1. Lambing results.

Sire Group	K	W	CH
Percent Lambs Dropped	195	182	167
Lamb Birth Weight (lbs.)	11.1	10.8	13.5
Death Loss	0	12.5	22.2

Two groups of lambs were placed on feeding trials and carcass data gathered. Because of management procedures and marketing decisions, the first group of lambs were placed on trial and marketed after a 45-day feeding trial. A 16 percent protein complete mixed ration containing 12 percent alfalfa pellets as a roughage source was fed free choice. Lambs were weighed every 2 weeks. Growth and feed consumption data were gathered.

A second group of April born lambs were placed on a compatible feeding regime after the first group. Again, because of management and marketing decisions, these lambs were placed on test at lighter weights and slaughtered at heavier weights.

Results of the finishing trials are listed in tables 2 and 3. In the first trial, the CH lambs gained the most rapidly. In the second trial, there was negligible difference between the average daily gains of the lambs. Because it was later in the year and there was substantially more hot weather, lambs on the second trial ate less and, consequently, grew less rapidly.

Table 2. Finishing data – Trial 1.

Sire Group	K	W	CH
ADG (lbs.)	.718	.806	.863
Feed Intake/d (lbs.)	3.76	4.14	4.96
Feed/Gain (lbs.)	5.24	5.14	5.75
Dry Matter/Gain (lbs.)	4.65	4.56	5.11

Table 2. Finishing data – Trial 2.

Sire Group	K	W	CH
ADG (lbs.)	.673	.651	.644
Feed Intake/d (lbs.)	3.17	3.32	3.18
Feed/Gain (lbs.)	4.71	5.10	4.94
Dry Matter/Gain (lbs.)	4.18	4.53	4.39

Slaughter data is presented in tables 4 and 5. In both data sets, K sired lambs had less fat measured at the ribeye and by body wall thickness. This accounts for the fact that K sired lambs had the highest percent boneless closely trimmed retail cuts (percent BCTRC). Ribeye areas were similar within each trial and larger in the second trial where the carcasses were slightly heavier. In both trials, W sired lambs had the highest (but not significant) conformation scores. This was easily observable visually in these W lambs.

Table 4. Carcass data – Trial 1 (45 d).

Sire Group	K	W	CH
Hot Carcass Weight (lbs.)	59.98	56.13	63.13
ERA (in. sq.)	2.43	2.47	2.46
Conformation Score[1]	10.56	11.13	10.67
Lean Color	2.99	2.72	2.83
Fat (in.)	.13	.20	.18
Body Wall Thickness (in.)[2]	.61	.76	.68
Percent BCTRC	48.10	47.46	47.35

Table 5. Carcass data – Trial 2 (99 d).

Sire Group	K	W	CH
Hot Carcass Weight (lbs.)	63.57	67.29	65.68

ERA (in. sq.)	2.65	2.59	2.55
Conformation Score[1]	11.40	11.44	10.85
Lean Color	3.18	3.01	3.25
Fat (in.)	.13	.18	.18
Body Wall Thickness (in.)[2]	.75	.87	.77
Percent BCTRC	47.63	46.69	46.89

[1]10 = Ch$^-$, 11 = Ch^0, 12 = Ch$^+$

[2]Percent boneless closely trimmed retail cuts

Conclusions:

Although smaller at birth, both K and W sired lambs showed exceptional vigor and recorded very low death loss.

Lambs gained more rapidly in the first trial when they were less stressed by heat and humidity with CH sired lambs gaining the fastest. No differences in gains by sire groups were recorded in the second trial.

Growth and feed efficiency measures for all lambs were acceptable.

Recorded carcass data indicates that the carcass value of hair sired lambs is very acceptable and comparable to that of some of our popular breeds.

Progress and Future Plans:

Two additional Katahdin rams were purchased in 2000 to be bred to the F_1 females as well as the crossbred foundation ewes. These rams originated from one of the most highly regarded flocks in the breed. Some of the females sired by a Katahdin x Wiltshire Horn ram were also exposed to lamb in the spring of 2001. F_1 Katahdin females will be bred in April to lamb in the fall to one of the two newly purchased rams.

F_1 Wiltshire Horn ewes will, likewise, be bred in April to the polled Wiltshire Horn x Katahdin ram for the production of one-half Wiltshire Horn, one-quarter Katahdin, one-quarter crossbred progeny. This is done for several reasons. First, purebred Wiltshire Horn rams are very difficult to find and acquire because of the very low population of this breed of sheep. Second, the polled factor is desirable; and it is hoped that this polled ram will help incorporate this trait into higher percentage progeny. Third, the Katahdin reportedly has a higher propensity for out of season (fall) lambing than does the Wiltshire Horn, so incorporation of this trait is also desirable.

Two purebred Katahdin ewes were acquired from the Fortmeyer flock in Kansas. Both of these ewes were super ovulated, flushed, and embryos transferred to recipient ewes. The goal of this process is to use the new embryo transfer techniques developed at NDSU in the expansion of this purebred Katahdin flock.

Most one-half and three-quarter hair-sired male lambs will again be evaluated through feed trials and carcass data will be gathered. A few outstanding three-quarter ram lambs which show the desirable shedding traits may be retained for use in the expanding flock.

Contact has been established with several other universities and agricultural experiment stations throughout the country, all of which have on-going interest and research activities with hair sheep. Grant applications for funding have been made which are currently pending.

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