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Livestock Section
AZRI, Quetta

STATUS PAPER/RESEARCH ACHIEVEMENTS UNDER MART/AZR AND BOSTID PROJECTS

A. BODY CONDITION SCORING AND EWE FERTILITY:

Research in other parts of the world has demonstrated that improving ewe nutrition by supplementing protein and or energy prior to mating, generally termed as flushing, can increase ovulation rates and hence reproductive performance when ewes are in good body condition. Ten to twenty percent more lambs can be expected as a result of flushing moderately underweight ewes Similarly, supplementation during late-gestation and early lactation can result in higher lamb birth and weaning weights and will adequately prepare ewes for the next production cycle.

In typical flocks in Balochistan between 60 and 75 lambs are born every 100 ewes mated. The low lambing rate is largely because ewes are under nourished and poor body condition at mating. Past studies at AZRI on feeding of supplements before mating, a practice called flushing, improved lambing rates. However, some savings in feed costs could be achieved if ewes in good body condition and therefore fertile were not flushed. Further more, numerous studies show that body condition is fairly precise predictor of ovulation rate and subsequent lambing rate in prolific ewes. Fertility responses to flushing are quite variable and this makes it difficult to define a level of feeding to ensure conception and a successful pregnancy. Body Condition Score (BCS) is determined manually assessing the tissue cover the transverse processes on the first ten lumber vertebrae. A value is assigned in half units from 0.5 (at point of death) to 4.5 over-fat.

The first studies on the effect of BCS on fertility were initiated in July 1990 at Range Livestock Research Stations Tomagh and Zarchi. Mortality of ewes were low at Tomagh but at Zarchi some mortality was apparent which decreased as BCS improved. At Tomagh lambing rate of medium BCS was 100% and 86-94% in the low BCS group. There was no apparent effect of feeding on lambing rate. At Zarchi overall lambing rate was lower than Tomagh and the lambing rate of ewes in both the supplemented groups responded to feeding. However, the lambing rate in the low and medium groups averaged over the un-supplemented and supplemented treatments were similar. Similarly at Zarchi, there were only small differences between the live weight of the different groups 56 days before mating and ewes receiving supplements gained modest amount of live weight. Despite the lack of clear results, the experiment showed that saving in the supplementary feed could be made by feeding only thin Harnai ewes.

However, Balochi ewes in both the low and medium BCS groups may need to be fed.

The studies on fertility of Harnai and Balochi ewes as influenced by differences in BCS and supplementation during mating was continued at both the stations during 1991-92. The results of the trials at Tomagh and Zarchi showed that the lambing rate was same in low BCS ewes at Tomagh whether or not they receive supplements. In the medium BCS groups that received no supplements, lambing rate was 82%. At Zarchi feeding ewes in poor body condition during the breeding period resulted in substantial improvement in lambing rate from 54 to 84% which was higher than the lambing rate in the un-supplemented medium BCS group. Supplementation of low BCS ewes also resulted in an improvement in the birth weight of their lambs. The benefits to lambing rate of feeding ewes in poor body conditions during the breeding season were still unclear, at least at Tomagh. For this reason the experiment repeated in 1993-94.

Research studies conducted during 1988-90 at the Arid Zone Research Institute (AZRI) on the nutritional management of sheep showed supplemental feeding of protein and energy at critical times during the production cycle (breeding, late-gestation and early lactation) could improve ewe fertility from 60-70% to above 90% However, there was need to clearly define the optimum kind of supplementation and levels to obtain maximum output and better understand the biology and factors responsible for low fertility. Therefore, research under HORTIB was begun in 1992 to study the impact of protein and energy supplementation on the productivity of sheep in terms of ewe and lamb performance under the dry land conditions of highland Balochistan.

Ewes fed the higher level of supplement lost less weight than the ewes fed the low and medium levels at Zarchi. The ewes fed the higher barley and cottonseed cake levels at Zarchi maintained higher live weights than ewes fed only 1/3 the amount of supplement. No difference in the body weight of Harnai ewes put under the three feeding levels at Tomagh was found almost throughout winter. As body condition scores increased, fertility improved from [illegible] to [illegible]. Fertility levels of 75, 70 and 54% in Balochi ewes with body condition score of 1.0-1.5 were observed during 1990, 1991 and 1992, respectively (AZRI/ICARDA, 1991, 1992 and 1993). This study also showed the positive effects of flushing particularly of ewes that are in poor condition. No effect of any of the three feeding levels was observed on fertility, mortality or prolificacy of Harnai ewes at Tomagh. During 1989, 1990 and 1991, 100, 88 and 100% fertility rates were observed in poor condition ewes. Therefore, at Tomagh, the benefits of supplemental feeding on fertility of ewes in poor body condition were not evident. Most of the times, the feeding has not shown any differential impact on fertility of ewes.

B. LAMB FATTENING:

The small ruminants in Balochistan mainly depend upon poorly managed rangelands and sparsely available crop residues. This poor underlying nutrition makes it extremely difficult to carry animals through critical periods even without expecting any increase in their productivity. Being able to wean lambs at 3-4 months of age and fatten them under intensive feedlot conditions has not only the potential of relieving grazing pressure on some of the most degraded ranges and thus reducing needs of the dam for feed to produce milk for the suckling lambs but also increase the farmer's income.

A fattening trial was conducted at Range Livestock Research Station, Zarchi during 1989 on thirty six growing Balochi lambs 5-6 months old. These lambs were reared under extensive (Grazing only), Semi-Intensive (Grazing and 7 Kg concentrate for 12 lambs and Intensive (15 Kg concentrate for 12 lambs and no grazing) management systems. The lambs reared under extensive management systems lost weight during the trial whereas the lambs reared under intensive and semi-extensive management system gained weight. Lambs on extensive and semi-intensive systems showed less than 10% mortality whereas the mortality in the lambs under intensive management was zero.

Another five week trial was conducted between April and May 1993 at Animal Nutrition Research Unit (ANRU), Quetta using sixteen male Balochi lambs 8 to 10 month of age each weighing 18.4 to 33.2 kg. The lambs were randomly divided into eight groups having similar live weights, each pair was randomly assigned to one of eight fattening pens. The two iso-caloric ration were prepared and were composed of barley, cotton seed cake, pea seeds, rice polishing (comes off the rice as a result of it being polished), sorghum, wheat bran, molasses, and A vitamin-mineral premix. The base ration (A) contained 12 percent crude protein and was fed daily at 08.00 hr to four of the eight pens while the remaining four pens received the base ration supplemented with urea (B) to raise the crude protein level to 17 percent. Mean daily gain was 189.3±28.7 and 245.0±28.7 grams by the lambs fed on rations A and B, respectively. A non-significant difference was observed among both the groups. Mean daily feed consumption for the lambs fed on rations A and B were 1445.7±60.4 and 1738.6±80.4 g, respectively. Significantly higher ($P<0.05$) feed consumption was observed in the lambs fed on ration B as compared to those fed on ration A. However, a mean significant difference was observed in feed efficiency values of the lambs fed on ration A and B. A Non-Significant difference was also observed in the weight and feed efficiency values of the lambs included in the lower (Less than 30 Kg) and higher (more than 30 Kg) body weight groups. The results of study suggested that the Balochi lambs 8 to 10 months of age gain equally good when fed on ration containing 12% and 17% Crude Protein.

A trial was also conducted involving 32 (16 Balochi and 16 Harnai) male lambs about four to five months old at ANRU, Quetta during September to December 1993. The lambs were divided into eight groups in such a way that there were four lambs of a breed in one group. These groups of lambs were assigned eight different lamb fattening pens randomly. The lambs were fed on two iso-Nitrogenous rations A and B having 2300 and 2700 Kcal of Metabolizable Energy respectively. The experimental rations were also assigned randomly in such a way that there were two pens (8 lambs of Harnai breed) on ration A and two pens (8 lambs of Harnai breed) on ration B. Similarly the two pens (8 lambs of Balochi breed) were assigned to ration A and two pens (8 lambs of Balochi breed) on ration B. Data on feed offered and feed refused was collected on daily basis. While data on live body weights were collected on weekly basis. The trial was continued for a period of twelve weeks. Significant difference in overall average daily weight gain per lamb was observed. The lambs fed on ration containing 2700 kcal of energy gained significantly more weight than those fed on ration containing 2300 Kcal of Metabolizable Energy. Daily weight gain values for the Balochi and Harnai lambs fed on different rations were 171.6±12.0 and 127.4±12.0 grams respectively. Balochi lambs gained significantly ($p < 0.05$) more weight as compared to Harnai lambs. The Average daily Feed consumption values for the Balochi and Harnai lambs were 1214.6±17.7 and 1016.4±17.7 grams respectively. Balochi lambs consumed significantly ($p < 0.10$) more feed as compared to Harnai lambs. The average daily feed consumed by the lambs fed on rations A and B were 1071.3±17.7 and 1050.7±17.7 grams respectively. Significantly more feed was consumed by the lambs fed on ration A than the lambs fed on ration B. The results of the study indicated that the Balochi lambs performed better in terms of weight gain than the Harnai lambs. Moreover the lambs fed on high energy rations (2700 Kcal/Kg of ME) gained more weight as compared to the lambs fed on low energy rations (2300 Kcal/Kg of ME).

It was concluded from this trial that male lambs of Balochi breed, 8 to 10 months of age with body weight below 23.5 Kg may be preferred for intensive fattening and may be fed on rations containing 12% Crude Protein. Male lambs of Balochi and Harnai breeds, 4 to 5 months old may be fed on high energy rations (2700 Kcal) for better gains. Whenever there is a choice between Balochi and Harnai Breeds, Balochi male lambs may be preferred for rearing under intensive feedlot for better body weight gain.

C. MONITORING THE MANAGEMENT PRACTICES AND ANIMAL PERFORMANCE IN FARM ANIMALS

Studies during the last 3-4 years at AZRI and its two Range-Livestock Research Stations at Zarchi and Tomagh have shown that improved nutritional management of ewes during their breeding cycle improves ewe fertility, lamb growth rate and reduces ewe and lamb

mortality. Even though the results obtained so far appear promising as compared to the performance of ewes raised under traditional management practices, the comparisons made so far have been based on information collected through surveys in these areas or without control treatments that are not true representative of local flocks.

Therefore, a study was initiated under BOSTID in December, 1992 involving the sheep and goats maintained by farmers in Zarchi and Tomagh areas to monitor the year round management of sheep and goat by them. The study is continued and will establish a basis for comparing performance of sheep raised under traditional and improved nutritional management in highland Balochistan. It will also document the information collected so far through surveys on sheep/goat production practices and potentials in the region.

D. PARASITIC INFESTATION IN SHEEP AND GOATS:

Among various factors responsible for economic losses in the sheep and goat production operations in Balochistan, parasitic diseases seem to be of potential importance. Although mortality rate due to parasitic disease are low, economic losses can be encountered in the form of reduced efficiency of feed utilization, loss of condition, retarded growth rate and subsequently loss of milk, meat and wool production. Such losses could take a heavy annual toll in profit exceeding those due to bacterial diseases, but because losses from parasites are unspectacular and difficult to evaluate, they do not receive the attention they deserve.

Studies/surveys were carried out during first phase of MART/AZR in Kalat, Loralai, Peshin and Zhob districts of Balochistan. A total of 68 flocks were randomly selected from these areas. Fecal samples were collected from each flock directly from rectum. The data from studied indicated that almost 90% of the sheep in these areas were infected with internal parasites. Of these, each sheep was parasitized with at least one species and as many as 6 different types of ova were recorded from one animal. Eighteen different types of internal parasites were present in these areas during this period.

RECOMMENDATIONS:

o Provision of supplemental feeding to Balochi ewes during breeding is essential to improve their body condition score up to a minimum of 2.0-2.5. This allows fertility to exceed 90% and would result in a substantial improvement in flock productivity.

o Male lambs of Balochi breed, 8 to 10 months of age with body weight below 23.5 Kg may be preferred for intensive fattening and may be fed on rations containing 12% Crude Protein.

o Male lambs of Balochi and Harnai breeds, 4 to 5 month old may be fed on high energy rations (2700 Kcal) for better gains.

o Whenever there is a choice between Balochi and Harnai Breeds, Balochi male lambs may be preferred for rearing under intensive feedlot for better body weight gain.

o All the sheep and goats raised under free range grazing conditions should be drenched for the control of internal parasites at least once in every three months period.

FUTURE THRUSTS:

- Research trial on " Production performance of Harnai ewes in different body condition scores with winter supplementation when bred in two different seasons in highland Balochistan" will be conducted. This would assess the feasibility of getting out of season lambs for future feedlot operations.

- Further studies on "Assessing the fattening potential of Balochi and Harnai lambs under intensive feedlot conditions" will be conducted and cost-benefit ratio of such operations would be determined.

- The trial on "Monitoring of on-farm performance of Harnai sheep breed and goats raised under traditional management in highland Balochistan" will continue in Tomagh area.

- More efforts would be directed in future to physically demonstrate the benefits of winter supplemental feeding at the farmers flock level. For this purpose, balance and economical rations would be formulated. Establishment of AZRI feedmill is one step towards this direction.

- Lamb fattening may be left to commercial feedlots/private entrepreneurs near big town and more efforts would be to have fertile ewes and produce more lambs.

- Health cover provision should accompany all the nutritional management programmes and supply od medicines and vaccines at the farmer doorsteps have to be insured.

- Assessment of nutritional value of arid zone feeds/forages through chemical and biological methods would continue as a part of research program for better understanding of availabled and needed sheep/goat feed resources.