

EFFECTS OF ARTIFICIAL REARING ON THE SURVIVAL AND EARLY GROWTH OF LAMBS

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ABSTRACT

The experiment was conducted to determine the effect of artificial feeding on survival and early growth of ram lambs. Nine new born lambs of single births were randomly assigned to 3 treatments of 3 lambs each. In the control group (T_1) the lambs suckled their dams naturally and lambs in the group T_2 and T_3 were separated 1 and 4 weeks post partum from their dams respectively and fed artificially on fresh cow milk until the age of 12 weeks. Mean body weights of the lambs at birth, 3 and 6 weeks were significantly different ($P < 0.05$) for the 3 groups. By the 9th week however, the artificially reared lambs (T_2 and T_3) were significantly ($P < 0.05$) heavier than the control, while at 12 weeks, the T_2 lambs weighted significantly ($P < 0.05$) more than the T_1 and T_3 lambs, and the T_3 lambs more than the T_2 lambs. The artificially reared lambs, taken together, weighed more than those nursed by their dams at 12 weeks of age despite the relatively higher nutrient level of the ewes milk compared with the cow milk.

INTRODUCTION

Maximum productivity from sheep and the potential for increased supply of proteins from them are no doubt intimately linked with the number of lambs born and kept alive. Besides, early growth rate is very important under the intensive system and it is mostly dependent on the milking

ability of the Ewe (Devendra and Mcleroy, 1982).

Naturally, the rearing of the lamb is done by the ewe. Sometimes, however, the death of the dam shortly after parturition or the production of three or more lambs in a single parturition may necessitate the rearing of affected lambs artificially if they must be

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kept alive. Lambs require colostrum early in life as a means of acquiring passive immunity to diseases until they can develop their own immunological system. Thus most lambs deprived of colostrum die shortly after birth while the few which have been reported to survive exhibit lower growth rates than lambs given colostrum (Halliday, 1968; Campbell, 1974; Penning, 1979). Therefore the success of any artificial rearing programme for orphan lambs depends to a large extent on their access to colostrum (Gatenby, 1991) within the first two days of life (Nedkvitne and Haughland, 1970; Bryant and Owen, 1971; Campbell, 1974; Penning, 1979) or blood serum from sheep (Gamble *et al.*, 1938) as well as the quantity of milk produced by the ewe (Devandra and Mcleroy, 1982).

Why successes in artificial rearing of lambs have been reported in temperate environments using milk or milk substitutes, reports about similar works in the tropics are limited. The objective of this study was therefore to look at the survival and early growth in lambs separated from their dams one or four weeks post partum fed artificially on cow milk.

MATERIALS AND METHODS

Nine Permer X West African Dwarf crossbred ram lambs of

single births weighing between 1.8 and 2.2kg at birth were used in this study over a 12 week period. The lambs were randomly selected from a flock of intensively reared nursing ewes housed individually with their lambs. Each dam was on a daily ration of freshly cut guinea grass provided in the morning and evening and supplemented once a day with 150g groundnut cake. Water and salt lick was available free choice.

The lambs were assigned to 3 treatment groups designated T₁ (control group), T₂ and T₃ on the basis of age. Each group comprised 3 lambs as replicates, with the lambs in each group penned together. Lambs in the control group (T₁) were allowed to suckle naturally while their dams continued with the feeding regime earlier describe. In groups T₂ and T₃ the lambs were separated from their dams at one and four weeks post partum respectively, and fed artificially on fresh cow milk harvested daily, using 236ml polycarbonated nursery bottles fitted with rubber nipples. The milk was warmed slightly before each feeding. For the first 3 days lambs in these two groups were fed 4 times daily to get them used to suckling from the nursery bottles, and 3 times a day thereafter at approximately regular intervals

as described by Large (1965). They were fed to appetite at each feeding.

Apart from birth weights, individual weekly live weights were recorded prior to feeding on each weighing day. Representative samples of the cow milk as well as the milk of the dams in the control group were collected on the first day, 6th and 12th week and chemically analysed according to AOAC (1975) procedures to determine their average proximate composition. The live weight measurements at birth, 3, 6, 9 and 12 weeks were statistically analysed using the one-way analysis of variance and Duncan's test (Zar, 1984).

RESULTS AND DISCUSSION

The proximate chemical composition of the cow and ewe milk used in feeding the animals is presented in Table 1 while Table 2 shows body weight means and standard errors. There was a relatively higher protein and fat contents in the ewe milk compared with the cow milk. Despite this fact, the artificially reared lambs, taken together, weighed significantly ($P < 0.05$) more than those nursed by their

dams at 12 weeks of age (Table 2). This may have been due in part to the fact that the artificially fed lambs which were always fed to appetite, may have received relatively more milk than the naturally suckled ones, since milk yield in most lactating ewes usually peaks within one or two months and declines thereafter (Devendra and McLeroy, 1982; Gatenby, 1991).

There was no significant difference ($P > 0.05$) in the mean body weights of the lambs between the groups in initial weights which agrees with Peart *et al* (1972), and in 3 and 6 weeks body weights (Table 2). At the 9th week however, the artificially reared groups (T_2 and T_3) weighed significantly more ($P < 0.05$) than the control lambs. In the 12th week, lambs separated from their dams one week post partum (T_2) were significantly heavier ($P < 0.05$) than those in each of the other two groups while T_3 lambs weighed more than the T_1 lambs.

Table 1: Average Proximate Composition of Cows' and Ewes' Milk

Constituents	Cow's Milk (%)	Ewes' Milk (%)
Water	85.90	82.80
Total solids	14.10	17.20
Protein (N x 6.38)	3.50	4.44
Fat	3.90	7.20
Lactose	5.91	4.68
Ash	0.79	0.88

Table 2: Means and standard errors of body weights of the different groups of Lambs at different stages

Treatment Groups	Initial Weight	3 Weeks	6 Weeks	9 Weeks	12 Weeks
T ₁	1.96 ^a	3.77 ^a	5.37 ^a	6.00 ^b	6.43 ^c
T ₂	2.10 ^a	3.73 ^a	5.83 ^a	8.17 ^a	9.83 ^a
T ₃	1.96 ^a	4.20 ^a	5.83 ^a	7.43 ^{ab}	8.47 ^b
SEM	0.06	0.31	0.44	0.30	0.28

Means with different superscripts are significantly different $P < 0.05$

SEM = Standard error of mean.

T₁ = Lambs with dams

T₂ = Lambs separated from dams at one week old

T₃ = Lambs separated from dams at four weeks old.

The T₂ lambs growth superiority over the T₃ lambs may be attributed to the fact that they learnt to suckle from nursery bottles faster than the T₃ lambs. Suckling activity which is high in newborn lambs declines progressively with time (Alexander and Williams, 1966) and Bryant and Owen (1971) observed that the longer a lamb suckles its dam, the longer it takes to learn to feed itself when reared artificially. Besides, the growth superiority could also have been due to the fact that the T₂ lambs were fed to appetite for 11 weeks whereas the T₃ lambs were so fed just 8 weeks.

Although cow milk is not well utilized as ewe milk (Pinot and Teissier, 1965), orphan lambs have traditionally been artificially reared successfully with cow milk (Large, 1965). Consequently, no deaths were recorded in this experiment. Apart from mild scouring amongst some of the lambs observed to be usual (Walker and Faichney, 1964) they were healthy throughout the study period and physically in good shape.

The results of this study reveals the possibility of successfully keeping alive lambs separated from their dam 1 and 4 weeks post partum

through artificial feeding of whole cows' milk. Nevertheless, although artificial rearing shows the prospect of better reproductive performance, the survival rate of lambs reared with their dams has been shown to be higher due to bloat in the artificially reared ones (Shrestha

et. al., 1993). From these results further investigations are suggested using more lambs involving the sexes and in the area of labour saving methods for providing liquid food to these lambs.

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