PERFORMANCE OF LAMB FED UREA TREATED SAGO FIBRE BASED DIET WITH SUPPLEMENTS

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Summary

Lamb fed 2% urea treated sago fibre and corn at 1.5 : 1 ratio (sago fibre + corn) and supplemented with fishmeal at 0, 50, 100, 150 g/head/day, gained 68.6, 139.6, 158.6 and 166.3 g/day, respectively. A simple feed cost analysis indicated that the sago with supplementation of fishmeal at 50 g/head/day could be an efficient and economic diet for sheep. The result showed that energy and protein supplements are necessary for reasonable performance of the sheep fed on urea treated sago fibre.

(**Key Words**: Crossbred Lambs, Sago Fibre, Liveweight Gain, Feed Intake, Supplementation)

Introduction

Sago fibre, a by product of sago starch extraction, has a potential to be utilized as ruminant feed (Jalaludin, 1987). Based on the current production of sago in Malaysia, more than 47,000 tonnes of sago fibre is produced annually. However, sago fibre has several limitations such as low nitrogen (N) (3.0%), low mineral content and low digestibility, consequently caused lower feed intake as observed in lambs (Yadav and Mahyuddin, 1991). Urea treatment (2%) was found to be effective to improve the nutritive value of sago fibre but the treated feed was only capable of maintaining the weight of sheep.

The purpose of this study is to investigate the effect of feeding of urea treated sago fibre supplemented with corn and various levels of fishmeal on the performance of lambs.

Materials and Methods

Experimental Animal

Thirty-two crossbred (Dorset × Malin) male lambs (10−19 kg liveweight) were housed indoors in individual pens. Eight lambs were allocated to each of the four experimental diets in randomized complete block design. All the animals were drenched with antihelmintics and 3 weeks adjustment period were allowed for the experimental diets.

Diet and Measurements

Each batch of 200 kg air dried sago fibre (moisture content 20%) was sprinkled with 2% fertilizer grade urea (46% N) using a garden watering container, mixed using a rake and was ensiled in plastic bags for 2 weeks. The urea treated fibre was mixed with ground corn at ratio 1.5 : 1 (w/w) prior to each feeding.

In addition, each animal was offered 50 g/d molasses which was mixed with the basal diet and 20 g/d commercial mineral premix (CM-10, Lazuli Co. Ltd., Kuala Lumpur).

Fishmeal supplementation of 0, 50, 100, 150 g/head/day forms the experimental diets (table 1). The lambs were fed daily at 09 : 00 h and 16 : 00 h. The fishmeal was offered prior to morning feeding to ensure complete consumption by the lambs.

All lambs were weighed at beginning of the experiment and bi-weekly during the 150 days trial. Daily feed intake was recorded for each lamb.

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TABLE 1. EXPERIMENTAL DIET AND TREATMENT GROUPS

Treatment groups	Basal diet	Fishmeal (g/lamb/d)
A	Treated sago fibre + corn + molasses + mineral	0
B	"	50
C	"	100
D	"	150

Analytical Methods

Samples of feed offered and refused were collected, weighed and subsampled daily with 10% being kept for proximate analyses (A.O.A.C., 1980). Dry matter (DM) was determined in forced air oven at 105°C for 24 hours and ashing was carried out in a muffle furnace at 550°C for 3-4 hours. Crude protein (CP) content was determined by standard Kjeldahl procedures. Calcium (Ca), magnesium (Mg), copper (Cu) were analysed by atomic absorption spectrophotometer and phosphorus (P) by a single-beam spectrophotometer. Gross energy(GE) was measured in adiabatic bomb calorimeter.

Statistical Analysis

Analysis of varians (Steel and Torrie, 1960) using Statistical Analysis System (SAS) was carried out on the data obtained. Duncan's multiple range test was used to compare differences of means due to treatments.

Results and Discussion

The chemical composition of the diet used in the experiment are shown in table 2. Group A diet contained no fishmeal and served as the control with a CP content 9.15%. The fishmeal was added to the basal diets for group B, C and D resulting in CP express as % of diets respectively.

Fishmeal supplementation (table 3) resulted in significant increase ($p < 0.01$) in daily DM intake by lamb (32.5 38.7 g/kg liveweight). These observations are in agreement with Balch and Campling (1962) and Sitorus et al. (1986) who demonstrated that protein supplement increased total DM intake.

Fishmeal supplementation increased the liveweight (LW) gain significantly ($p < 0.001$) from 68.6 to 166.3 g/d. This increase in liveweight was associated with the large increase in total food intake. It was also associated with the additional supply of bypass protein (fishmeal) to increase the availability of amino acids for absorption from the small intestine (Kempton et al., 1979).

Conversion of total feed DM intake to liveweight gain decreased signficantly ($p < 0.001$) with increasing levels of fishmeal from 8.4 to 5.1 kg feed/kg LW gain due to additional supply of amino acids from fishmeal (table 3). This result was similar in magnitude as reported by Sudana and Leng (1986) and Wanapat et al. (1986).

TABLE 2. COMPOSITION OF THE DIETARY INGREDIENTS (% DM)

Feedstuff	DM	Ash	CP	GE (MJ/kg)	Ca	P (mg/g)	Mg	Cu (μg/g)
Urea treated fibre	46.1	8.4	8.6	13.3	2.2	1.3	0.4	0.3
Corn	88.3	1.5	9.8	17.9	5.8	2.5	0.9	1.9
Fish meal	89.1	27.3	56.5	14.5	48.0	13.9	3.7	4.2
Molasses	72.6	6.9	1.9	16.6	10.6	0.2	20.7	3.4
Basal diet	64.0	5.7	9.1	15.2	3.7	1.86	0.7	1.0
Mineral premix					131.8	67.3	4.8	687.3
Untreated Sago fibre	70-80	8.8	3.0	13.7	2.3	1.3	0.5	0.4

TABLE 3. GROWTH PERFORMANCE OF SHEEP FED SUPPLEMENTED SAGO FIBRE TREATED DIETS

Fishmeal	Treatment Diet				s.e.d.	Sig
	0	50	100	150		
No. of lambs	8	8	8	8		
Initial Wt (kg)	14.1	14.0	14.0	14.0	0.6	NS
Final Wt (kg)	20.3	26.3	28.3	29.0	0.9	***
LWG gain (g/d)	68.6	139.6	158.6	166.3	5.3	***
Feed DM intake						
(g DM/d)	559.4	734.2	785.9	837.9	34.8	**
(g DM/kg M.d)	32.5	35.8	37.1	38.7	0.7	***
(g DM/kg M 0.75.d)	66.0	75.9	79.5	83.4	1.8	***
Total DM intake (kg)	50.3	66.1	70.7	75.4	3.1	**
Feed Conver. Rate						
(kg DM feed/kg M)	8.4	5.3	5.1	5.1	0.2	***
Total Wt gain (kg)	6.2	12.6	14.0	15.0	0.4	***

Row means without a common superscript are significantly different ($p < 0.05$)

TABLE 4. ESTIMATION OF COST OF FEEDING LAMBS ON VARIOUS EXPERIMENTAL DIETS

	Diet			
	A	B	C	D
Urea treated fibre (MR$ 0.05/kg)	1.32	1.66	1.66	1.67
Corn (MRS 0.48/kg)	8.46	10.61	10.64	10.68
Molasses (MR$ 0.12/kg)	1.13	1.13	1.13	1.13
Mineral (MRS 1.39/kg)	2.50	2.50	2.50	2.50
Fishmeal (MR$ 1.70/kg)	0.00	7.65	15.30	22.95
Total	13.41	23.55	31.23	38.93
Total LW gain (kg)	6.18	12.56	14.01	14.96
Cost of feed/kg LW gain (MR$)	2.17	1.88	2.23	2.40

Analysis of feeding costs of fattening lambs on diet based on urea treated sago fibre is shown in table 4. The cost of feed obtained from experimental diets A, B, C and D were 2.17, 18.8, 2.23 and 2.40 Malaysian ringgit (MR) per kg liveweight gain, respectively.

In this study, all the animals performed well at all levels of supplementation but the improvement in liveweight gain was optimised with 50 g fishmeal /head /d supplementation. It is concluded that supplementatin of fish meal is necessary to improve growth of lambs fed urea treated sago fibre and corn.

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