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INCLUSION OF GRADED LEVELS OF RICE POLISHINGS IN THE RATIONS OF OSSIMI MALE LAMBS

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SUMMARY

A feeding trail was carried out using 21 Ossimi male lambs, five to six months old, (three groups, seven each) to investigate the effect of inclusion of rice polishings (RP) in the rations to replace 0, 30 or 60% of a conventional concentrate feed mixture. The trial lasted for 16 weeks during which growth performance was studied. At the end of the trial, a digestion trial was conducted with three lambs chosen randomly from each group while the other four lambs were slaughtered to study physical and chemical characteristics of carcass. Daily DM intake increased with 30% level of RP in the ration while it decreased at 60% level as compared with the control. Rice polishings inclusion in the rations at 30% level resulted in similar growth performance and feed conversion (DM, TDN and DCP/unit gain) as compared to the control. On the other hand, RP inclusion at 60% level resulted in lower weight gain and negatively affected feed conversion (DM, TDN and DCP/unit gain) as compared with the other groups. Dressing perrcentage either based on fasting or empty body weights, kidney and testes weights and chemical analysis of meat of best rib cuts were not affected significantly by treatment. On the other hand, feeding lambs on 60% level of RP decreased weights of hot carcass, liver, lungs, and each of omentum, kidney and tail fats. It also decreased lean, bone and fat weights of best ribs cuts as compared with the other groups. In view of economic efficiency inclusion of RP in the rations at 30% level resulted in the highest relative economic efficiency (120%) as compared with the control or 60% level (being 100 and 78%, respectively).

Keywords : Lamb, rice polishings, growth, feed conversion, nutrient digestibilities, carcass traits.

INTRODUCTION

Rice polsihings, a by-product of rice sheller mills is considered a good source of protein and energy. It contains moderate percentage of protein along with high level of fat and low level of crude fiber, being 12.0, 18.1 and 7.6% on DM basis, respectively (Rao and Reddy, 1986). So, it is expected that rice polishings is a suitable source of both protein and energy to be included in the diets of farm animals due to its cheap price compared with the traditional feedstuffs as well as other concentrate feed mixtures.

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The objective of this study was to investigate the effect of inclusion of rice polishings in daily ration of Ossimi lambs to partly replace a conventional concentrate feed mixture at different levels on growth performance, nutrients digestibilities and carcass traits in order to reduce feed cost.

MATERIALS AND METHODS

This study was carried out at El-Hussein village, west of Nubaria, El-Behera Governorate, Egypt and the laboratories of Animal and Poultry Nutrition and Production Department, National Research Centre, Dokki, Cairo.

Twenty-one Ossimi male lambs, 5-6 months old with average weight of 30.11 kg, were used in a feeding trial lasted for 16 weeks. Animals were divided into three similar groups according to age and weight. Lambs from each group were assigned randomly to one of the following three experimental rations.

Ration 1 (control, T1) consisted of a conventional concentrate feed mixture plus groundnut hay (as a source of roughage) while rations 2 (T2) and 3 (T3) consisted of the same ingredients of the control but 30 and 60% respectively of the concentrate feed mixture was replaced by rice polishings (RP). Groundnut hay was offered *ad libitum* once daily at 02:00 p.m. while the concentrate portion of each animal was fed at a rate of 3% of live body weight divided into two equal parts, offered at 08:00 a.m. and 02:00 p.m. respectively. The composition of the experimental rations are presented in table 1. The chemical composition of different experimental feed stuffs are presented in table 2.

Table 1. Composition of the experimental rations

Ingredient, %	Rations		
	T1 Control	T2 30% RP	T3 60% RP
CFM*	71.25	43.81	21.99
Rice Polishings	0.00	18.77	32.98
Groundnut hay	28.75	37.42	45.03

* CFM = concentrate feed mixture, consisting of (as fed): 25% Sunflower meal, 30% wheat bran, 22% ground yellow corn, 12% chopped berseem hay, 8% chopped berseem straw, 2% limestone and 1% sodium chloride.

Table 2. Chemical composition of different experimental feedstuffs

Feedstuff	DM,%	DM Composition, %					
		OM	Ash	CP	CF	EE	NFE
CFM	88.61	91.95	8.05	15.53	14.83	2.50	59.09
Rice polishings	91.01	91.85	8.15	13.70	7.50	15.67	54.98
Groundnut hay	91.01	84.54	15.46	11.34	20.05	2.18	50.97
Ration I	89.29	89.82	10.18	14.33	16.33	2.41	56.76
Ration II	89.95	89.16	10.84	13.62	15.39	4.87	55.28
Ration III	90.47	88.59	11.41	13.04	14.76	6.71	54.08

Animals were individually fed and the daily residues of feed stuffs were removed and weighed. Animals were weighed bi-weekly after 12 h fasting period, then, daily allowances of concentrate portion were adjusted according to change in live weight.

At the end of the experiment three lambs from each group were chosen randomly to conduct a digestion trial for estimating nutrients digestibilities, feeding values and nitrogen balance. Animals were placed in metabolic cages for ten days as a preliminary period, followed by seven days collection period.

The remainder four lambs of each group were slaughtered after 18 h fasting period. Following slaughter and removing the pelt, the offals, thoracic and abdominal organs were removed and weighed. The contents of the digestive tract were also removed and their weight was subtracted from the slaughter live weight to obtain empty body weight. Weights of hot carcass (HCW, including edible organs and tail fat) and fat (tail, omentum and kidney) were recorded and dressing percentages based on fasting and empty body weights were calculated. Carcasses were split into fore and hind quarters between the 12^{th} and 13^{th} ribs and weighed.

The 9, 10 and 11^{th} rib section was removed from both sides and was physically dissected into lean, fat and bone tissues which were separately weighed. "Coefficient of meat" (meat included fat: bone ratio was determined).

Feedstuffs, feces, urine and meat were chemically analyzed according to A.O.A.C. methods (1990).

Data were analyzed using general linear procedure of SAS (1995), while Duncan Multiple Range Test (Duncan, 1955) was applied to compare the means.

RESULTS AND DISCUSSION

No health problems were noticed for all animals on the different experimental diets throughout the entire experimental period.

Data of growth performance (Table 3) indicated that lambs fed on the control ration (group 1) tended to surpass those fed on ration 2 (30% RP) in weight gain, average daily gain (ADG) and growth rate expressed as percentage of initial body weight ($P>0.05$). At the same time lambs of groups 1 and 2 surpassed ($P<0.05$) those of group 3 (60% RP) in the same above mentioned parameters with differences between group 1 and group 3 reached 40% for each of the previous parameters. This superiority of the control on the other groups may be attributed to similar trend found in nutrient digestibilities, nitrogen retention and nutritive values of the rations expressed as TDN and DCP, (Tables 5 and 6). With the higher values, it was expected that lambs fed on the control diet could retain more N and grow faster.

The present results agree well with those of Alvarez *et al.* (1981) who found an insignificant decrease in daily gain of calves with diet containing rice polishings (700g daily) compared with another one containing chopped immature green bananas (7.5 kg, daily) (423 *g vs* 445g respectively). Similarly, Llamas-Lamas *et al.* (1985) found that daily weight gain was not significantly different among groups of steers given untreated wheat straw or straw injected with ammonia without or with 30% sorghum or rise polishings. On the other hand, Albuernes *et al.* (1992) reported a decrease in mean daily gain of lambs when 10% rice polishings was fed as starch supplement compared with 10% rice bran or 20% wheat bran in diets based on chopped whole sugarcane with 3% urea.

It is clear from table 4 that DM intake of dietary concentrate portion (CFM + RP) was decreased with increasing RP levels, meanwhile, the intake from ground nut hay was increased. These results are in accordance with those of Cardenes *et al.* (1993) who reported a reduction in grass hay DM intake by sheep when fed with RP instead

Table 3. Growth performance of Ossimi lambs as affected by rice polishings inclusion in the rations

Item	Periods											
	0-8 weeks				8-16 weeks				0-16 weeks			
	T1***	T2	T3	± SE	T1	T2	T3	± SE	T1	T2	T3	± SE
No. animals	7	7	7		7	7	7		7	7	7	
Body weight, *kg*	30.89^a	29.51^a	27.94^a	1.29^{NS}	42.60^a	41.63^{ab}	37.97^b	1.28^S	55.97^a	53.46^a	47.86^b	1.47^*
Weightgain, *kg*[1]	11.71^a	12.11^a	8.03^b	0.34^{**}	13.37^a	11.83^b	9.89^c	0.46^{**}	25.09^a	23.94^a	17.91^b	0.45^{**}
Relative growth rate	37.91^a	41.07^b	35.90^a	1.58	31.39^a	28.42^a	26.05^a	1.19	81.73^a	82.39^a	60.13^b	3.22^{**}
Av. daily gain,g	209.18^a	216.33^a	143.37^b.	6.12**	238.78^a	211.22^b	176.53^c	8.15^{**}	223.98^a	213.78^a	159.95^b	3.99^{**}

1: Bodyweight: 1st period; the values represent initial BW of the trial; 2nd period; the values represent initial BW of this period; 3rd period; the values represent final BW at the end of the trial.

Relative growth rate was calculated as BWG/Initial BW

NS: Non significant

* Means in the same row, within each period, with different superscript differ ($p<0.05$).

** Means in the same row, within each period, with different superscript differ ($P<0.01$).

*** T = Treatment

Table 4. Daily feed intake and feed conversion of Ossimi lembs as affected by rice polishings inclusion in the ration.

Item	Periods											
	0-8 weeks				8-16 weeks				0-16 weeks			
	T1	T2	T3	± SE	T1	T2	T3	± SE	T1	T2	T3	± SE
No. animals	7	7	7		7	7	7		7	7	7	
Feed intake, DM (*Kg*/day)												
Concentrate	0.94^a	0.87^b	0.72^c	0.02^{**}	1.33^a	1.16^b	0.93^c	0.02^{**}	1.14a	1.02^b	0.83^c	0.02^{**}
Roughage	0.39^a	0.51^b	0.58^c	0.02^{**}	0.53^a	0.70^b	0.77^b	0.02^{**}	0.46a	0.61^b	0.68^c	0.02^{**}
Total	1.33^a	1.38^a	1.30^a	0.05^{NS}	1.86^a	1.86^a	1.70^b	0.05^*	1.60a	1.63^a	1.51^a	0.05^{NS}
Feed conversion (*Kg/ kg* gain)												
DM	6.40^a	6.42^a	9.12^b	0.35^{**}	7.83^a	8.86^b	9.67^b	0.29^{**}	7.10^a	7.62^a	9.39^b	0.24^{**}
TDN	4.21^a	4.04^a	5.14^b	0.22^{**}	5.16^a	4.04^b	5.14^b	0.21^{**}	4.67^a	4.80^a	5.29^b	0.15^{**}
DCP	0.73^a	0.59^b	0.80^a	0.03^{**}	0.86^a	0.81^a	0.85^a	0.03^{NS}	0.81^a	0.70^b	0.83^a	0.02^{**}

NS: non significant

* Means in the same row, within each period with different superscript differ ($P<0.05$)

** Means in the same row , within each period with different superscript differ ($P<0.01$)

of urea sugarcane molasses. Voluntary intake of grass hay was reduced in diets supplemented with RP (Cardenas *et al.*, 1993).

Lambs on the high RP diets (Table 4) converted feed DM and energy (TDN) less efficiently ($P < 0.05$) than those on the control or low RP diets which were similar. However, DCP conversion value was the best with lambs on 30% RP diet ($P < 0.05$) when compared with the control and those on 60% RP diets being similar.

The inspection of nutrients digestibilities of the tested rations (Table 5) showed an obvious decrease in each of OM, CP, EE and NFE digestibilities with RP feeding. The decrease was much greater with the high level of RP (OM and NFE digestibilities). On the other hand, CF digestibility was depressed with the high level of RP in the ration (60%) ($P<0.05$). The decrease in nutrient digestibilities of RP diets lowered the nutritive values of these diets expressed as TDN and DCP.

Table 5. Digestibility coefficients and feeding values of experimental rations

Item	Treatments			
	T_1 (control)	T_2 (30% RP)	T_3 (60% RP)	± SE
No. of animals	3	3	3	
	Digestibility coefficient, %			
OM	70.64^a	66.54^{ab}	63.68^b	1.72^{NS}
CP	79.19^a	66.14^b	65.04^b	1.92**
CF	48.50^a	52.75^a	28.58^b	2.90*
EE	73.83^a	61.98^b	59.65^b	1.14**
NFE	74.71^a	69.69^a	59.52^b	1.99**
Feeding Values, %				
TDN	65.82^a	63.02^b	56.59^c	1.73**
DCP	11.35^a	9.13^b	8.79^c	0.23**

NS = Non significant

*: Means in the same row with different superscripts significantly differ ($P<0.05$)

**: Means in the same row with different superscripts significantly differ ($P<0.01$)

Results of nitrogen balance (NB), (Table 6) revealed that nitrogen intake (NI) was highest with the control animals and decreased with each increase in level of RP in the diets ($P < 0.05$). This is attributed to the decrease in CP% of ration 2 and 3 containing RP along with the decrease in DM intake (Tables 2 and 4).

Fecal (F) and Urinary (U) N decreased with increasing RP% in the rations. This reflected the decrease in NI rather than better performance, since when the values of (FN + UN) was related to NI, the values increased ($P<0.05$) with increasing percentage RP in the rations. All the above- mentioned values resulted in poor N balance for rations containing RP expressed as N retained when compared with the control.

In General, the decrease in the performance i.e growth, feed conversion and nutrients digestibilities, associate RP feeding particularly at 60% level (ration 3) may be explained in the following points:

The high starch content of RP (258 g/kg DM) for full-fat RP and the rapid degradation of this starch within the rumen stimulate VFA production particularly with the inclusion of high levels in the diets (Cardenas *et al.* 1992). Also, Rathee and Lohan (1988) reported that the protein of RP was extensively degraded in the rumen.

Cardenas *et al.* (1993) found low microbial protein yield when RP was given, and they also reported that the supply to the rumen of N and fermentable energy from RP was less well synchronized, since with RP ammonia concentration peaked 1 h after feeding but VFA concentration were still rising 6 h after feeding.

Table 6. Nitrogen balance of Ossimi lambs as affected by rice polishing inclusion in the rations

Item	Treatments			
	T_1 (control)	T_2 (30% RP)	T_3 (60% RP)	± SE
No of animals	3	3	3	
Nitrogen balance (g/day)				
Intake (I)	34.85^a	30.93^b	23.62^c	0.97^{**}
Feacal (F)	8.11^a	8.03^a	5.64^b	0.46^{*}
Urinary (U)	19.86^a	17.13^b	13.73^c	0.62^{**}
Retained (R)	6.88^a	5.78^a	4.26^b	0.34^{**}
NR% from NI	14.33^a	13.81^b	13.51^c	0.00^{**}
(UN + FN) % from NI	2.62^a	5.19^b	8.34^c	0.00^{**}

*: Means in the same row with different superscript significantly differ (P<0.05)

**: Means in the same row with different superscript significantly differ (P<0.01)

On the other hand, it was reported that fat in the rumen appears to inhibit fibre degradation (Harfoot, 1974), and may be toxic to cellulolytic bacteria (El-Hag and Miller, 1972). The high concentration of fat in RP might therefore be expected to lead to a reduction in dietary intake as suggested by Devendra and Lewis (1974). The high lipid concentration of RP, mainly in the form of oleic, linoleic and palmitic acids which accounted proportinately for over 96% (by weight) of total fatty acids (Cardenas *et al.*, 1993) are recognized to have antibacterial effect (Colman, 1980). Also, lipids have been shown to inhibit the growth of rumen protozoa (Broudiscou, 1990).

On the other hand, other workers have observed little or no effect on the rumen fermentation *in vivo* of including RP at up to 250 g/kg diet (Ferreiro *et al.*, 1979 and Valdez *et al.*, 1977).

Also the increase in groundnut hay with increasing % RP in the rations may involve in lack of performance particularly with ration 3.

It is clear from data presented in Table 7 that fasting and empty body weights were heavier with the control lambs followed by those on 30% RP and finally those on high RP level (P < 0.05). Hot carcass weight including edible organs followed similar trend. Omar and Houria (1994) and Houria *et al.* (1995) reported that carcass weights was increased with body size. Dressing percentages expressed as hot carcass weight based on empty body weight were not affected significantly by different treatments. Neck, fore-quarter and hind-quarter weights were decreased with RP feeding.

Results in table 8 showed that absolute weight of each head, four legs, full digestive tract and empty digestive tract decreased with feeding the high level of RP. This may be due to lower body weight. On the other hand, when weights of four legs and empty digestive tract were related to empty body weight, there were no significant differences among treatments.

Table 7. Carcass characteristics of Ossimi lambs as affected by level of rice polishings in the rations

Item	Treatments			
	T_1 (control)	T_2 (30% RP)	T_3 (60% RP)	± SE
No of carcasses	4	4	4	
Fasting body weight, kg	54.20^a	51.30^a	43.30^b	1.00^{**}
Empty body weight, kg	42.40^a	39.60^b	35.33^c	0.78^{**}
Hot carcass weight, kg	25.84^a	23.69^a	20.37^b	0.77^{**}
Dressing , %[1]	47.68^a	46.18^a	47.04^a	0.99^{NS}
Dressing , %[2]	60.94^a	59.82^a	57.66^a	1.92^{NS}
Neck, kg	1.99^a	1.68^{ab}	1.36^b	1.45^*
%[3]	7.31^a	6.74^a	6.29^a	0.46^{NS}
Fore quarter, kg	11.70^a	11.38^a	9.45^b	0.24^{**}
%[3]	43.21^a	45.78^b	44.12^{ab}	0.58^*
Hind quarter, kg	9.25^a	8.28^{ab}	7.53^b	0.31^{**}
%[3]	34.11^{ab}	33.30^b	35.04^a	0.35^*

1, based on fasting weight 2, based on empty weight
3, Percentages related to hot carcass weight NS: non significant
*: Means in the same row with different superscript significantly differ (P<0.05)
**: Means in the same row with different superscript significantly differ (P<0.01)

Kidney and test weights were not affected significantly by treatments while, weights of liver and lungs were decreased with the high RP level.

Each of omentum, kidney and tail fat weights decreased with the high level of RP compared with the control or low RP diets (P<0.05). Also it is clear that separable fat weights either as absolute or relative values to hot carcass weights were decreased with RP feeding. Relative differences of absolute separable fat weights between the control and those of groups 2 and 3 were 19.9 and 42.9%, respectively. The corresponding differences in relative separable fat to hot carcass among the same respective groups were only 10.8 and 13.8% .

The physical analysis of best ribs cut (Table 9) showed that lambs fed on RP had less lean, fat and bone weights, however when these values were expressed as percentages, there were no significant differences to be detected among different groups. Bonless meat % and lean/fat ratio were not affected by treatments.

Regarding the chemical analysis of meat (table 9), it was obvious that RP feeding did not affect significantly moisture, protein, ether extract or ash percentage

The data of economic efficiency as affected by inclusion of rice polishings in the rations are presented in table 10. Despite of lower price of rice polishings as compared with that of CFM which is reflected on lowering feed cost, the economical efficiency was decreased with 60% RP inclusion in the diets (group 3) as a reflection of lowering weight gain (Table 3). On the other hand, inclusion of RP in the rations at 30% level positively affected the economic efficiency as compared with those of the control due to lowering feed cost without affecting weight gain. Relative economic efficiency related to that of the control followed the same trend.

It could be concluded that inclusion of rice polishing in the rations of Ossimi lambs to replace up to 30% of the conventional concentrate feed mixture did not show marked negative effect on ADG, feed conversion, quantity and quality of produced meat.

Table 8. Offals of slaughtered Ossimi lambs as affected by level of rice polishings in the rations

Item	Treatments			
	T_1 (control)	T_2 (30% RP)	T_3 (60% RP)	± SE
Fasting body weight, kg	54.20[a]	51.30[a]	43.30[b]	1.00**
Hot carcass weight, kg	25.84[a]	23.69[a]	20.37[b]	0.77**
Head, kg	3.85[a]	4.15[a]	2.89[b]	0.18**
%[1]	7.10[a]	8.09[b]	6.66[a]	0.28*
Pelt, kg	4.91[a]	4.19[a]	4.59[a]	0.30[NS]
%[1]	9.08[ab]	8.18[a]	10.63[b]	0.67[NS]
Four legs, kg	1.26[a]	1.31[a]	1.01[b]	0.06*
%[1]	2.33[a]	2.55[a]	2.35[a]	0.14[NS]
Full digestive tract, kg	15.70[a]	15.70[a]	11.45[b]	0.48**
%[1]	28.96[a]	30.63[a]	26.41[b]	0.71**
Empty digestive tract, kg	3.90[a]	4.00[a]	3.48[a]	0.25**
%[1]	7.19[a]	7.81[a]	8.05[a]	0.61[NS]
Liver, g	833[a]	868[a]	748[b]	24*
Heart, g	290[a]	190[b]	210[b]	9**
Lungs, g	575[ab]	658[a]	510[b]	32*
Kidneys, g	138[a]	135[a]	128[a]	5[NS]
Spleen, g	60[a]	83[b]	55[a]	5**
Testes, g	270[a]	265[a]	245[a]	25[NS]
Omentum fat, g	133[a]	150[a]	95[b]	7**
Kindey fat, g	103[a]	105[a]	58[b]	5**
Tail fat, kg	2.90[a]	2.35[ab]	2.04[b]	0.182*
%[2]	10.71[a]	9.40[a]	9.47[a]	0.55[NS]
Separable fat, kg	3.13[a]	2.61[ab]	2.19[b]	0.19*
%[2]	11.56[a]	10.43[a]	10.16[a]	0.57[NS]
Edible organs, kg	1.26[a]	1.19[a]	1.09[b]	0.03**
%[2]	4.67[a]	4.78[a]	5.08[a]	0.19[NS]

1: Percentages related to empty body weight.
2: Percentages related to hot carcass weight.
NS: non significant
*: Means in the same row with different superscripts significantly differ ($P<0.05$)
**: Means in the same row with different superscripts differ ($P<0.01$)

Table 9. Physical and chemical composition of best ribs cut (9-10-11th) of slaughtered Ossimi lambs fed different levels of rice polishings

Item	T_1 (control)	T_2 (30% RP)	T_3 (60% RP)	± SE
No. of ribs cut	4	4	4	
Physical components				
Lean (L) weight, g	538.25^{a}	429.50^{b}	477.75^{ab}	26.48*
%	55.08	54.54	54.11	0.69^{NS}
Fat (F) weight, g	236.75	206.75	217.00	14.71^{NS}
%	24.16	26.24	24.61	0.82^{NS}
Bone (B) weight, g	202.50^{a}	151.25^{b}	187.75^{a}	8.88**
%	20.76^{ab}	19.23^{a}	21.28^{b}	0.49*
Bonless meat %	79.24^{ab}	80.77^{a}	78.73^{b}	0.49*
L/F ratio	2.28	2.09	2.21	0.1^{NS}
L/B ratio	2.67^{ab}	2.84^{a}	2.54^{b}	0.07*
Coefficient of meat[1]	3.84^{a}	4.20^{b}	3.70^{a}	0.11*
Chemical composition, % from fresh weight				
Moisture	57.68	57.36	57.26	0.85^{NS}
Protein	19.15	20.29	20.65	0.51^{NS}
Ether Extract	22.03	21.15	20.98	0.77^{NS}
Ash	1.17	1.20	1.11	0.06^{NS}

1: L + F/B ratio , NS: non significant

*: Means in the same row with different superscripts significantly differ (P<0.05)

**: Means in the same row with different superscripts significantly differ (P<0.01)

Table 10. Economic efficiency as affected by inclusion of rice polishings in the diets of Ossimi male lambs

Item	Experimental group		
	T1 (Control)	T2 (30% RP)	T3 (60% RP)
Total DM intake /lamb from			
CFM	126.84	79.53	36.95
RP	0.00	34.42	55.44
Groundnut hay	51.18	67.99	75.48
Total feed cost/lamb, L.E[1]	94.09	75.41	54.80
Initial body weight, kg	30.89	29.51	29.94
Final body weight, kg	55.97	53.46	47.86
Fixed cost/lamb, L.E.[2]	278.01	265.59	269.46
Management/lamb, L.E.[3]	50	50	50
Total cost/lamb, L.E.[4]	422.1	391	374.26
Selling income/lamb, L.E[5].	503.73	481.14	430.74
Net revenue/lamb, L.E	81.63	90.14	56.48
Economic efficiency[6]	0.193	0.231	0.151
Relative economical efficiency, %[7]	100	120	78

Prices of ton of CFM, RP and Groundnut hay were *L.E.*540, 120 and 300, respectively where DM = 88.61, 91.01 and 91.01%, respectively. Body weight x price of 1 kg (L.E).

Include medication, vaccines and sanitation., Include the fixed cost + management + feed cost.

Body weight x price of 1 kg at selling which was *L.E* 9, Net revenue per unit of total cost.

Assuning that relative economical efficiency of the control group equals 100.

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استخدام مستويات متدرجة من مخلف تبييض الأرز فى علائق الحملان الأوسيمى الذكور

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قسم تغذية وإنتاج الحيوان والدواجن المركز القومى للبحوث الدقى القاهرة

استخدم عدد (٢١) حمل أوسيمى عمرها حوالى ٥-٦ شهور ومتوسط وزنها ٣٠,١١كجم فى تجربة غذائية لدراسة تاثير احتواء العلائق على مخلف تبييض الأرز بمستوى صفر، ٣٠ أو ٦٠% استبدالا من مخلوط العلف المركز. وقد قسمت الحيوانات إلى ثلاث مجاميع متماثلة من حيث العدد والعمر ومتوسط الوزن ثم وزعت عشوائيا على المعاملات الغذائية. ولقد استغرقت التجربة مدة ١٦ أسبوع تم خلالها دراسة أداء الحملان من حيث معدلات الزيادة الوزنيه وكميات الغذاء المأكول وكفاءة التحويل الغذائى للمادة الجافة والطاقة والبروتين المهضوم المأكول إلى نمو.

وفى نهاية التجربة تم اختيار عدد ٣ حملان من كل مجموعة عشوائيا ليجرى عليها تجربة هضم لتقدير معاملات هضم المركبات الغذائية وتقدير ميزان الأزوت، بينما تم ذبح الحملان الأربعة الباقية من كل مجموعة لتقدير بعض القياسات على الذبيحة وكذلك إجراء التحليل الكيماوى للحم.

وقد أوضحت النتائج زيادة كمية المأكول من المادة الجافة للمجموعة التى احتوت عليقتها على مستوى ٣٠% من مخلف تبييض الأرز مقارنة بمجموعة المقارنة بينما انخفضت معاملات هضم جميع المركبات الغذائية نتيجة استخدام مستوى ٦٠% من مخلف تبييض الأرز بالعليقة وذلك مقارنة بمجموعة المقارنة أو مجموعة رقم ٢ المغذاة على مستوى ٣٠% فقط.

وقد انعكس ذلك بالتأثير السلبى على معدل الزيادة فى الوزن وبالتالى وزن الجسم عند نهاية التجربة وكذلك على كفاءة التحويل الغذائى كمادة جافة أو طاقة أو بروتين مهضوم مأكول/جم نمو للمجموعة المغذاة على مستوى إحلال ٦٠% مقارنة بمجموعة المقارنة أو بالمجموعة المغذاة على مستوى إحلال ٣٠% حيث كانتا متشابهتين، ولكن من ناحية أخرى فإن نسبة التصافى معبرا عنها كنسبة مئوية من وزن الجسم الصائم أو الفارغ وكذلك التحليل الكيماوى للحم فى الضلوع ٩-١٠-١١ لم يختلف معنويا بين المعاملات.

وقد أوضحت النتائج أيضا أن التغذية على مخلف تبييض الأرز بمستوى إحلال ٦٠% أدى لخفض وزن الذبيحة الساخن ووزن كل من الكبد والرئتين ودهن الاحشاء ودهن الكلية ودهن الذيل. وكذلك خفض أوزان اللحم والعظم والدهن كأوزان مطلقة فى الضلوع ٩،١٠،١١ مقارنة بمجموعة المقارنة أو المجموعة ذات مستوى الإحلال ٣٠% وأظهرت النتائج أيضا انخفاض الكفاءة الاقتصادية للتغذية على مخلف تبييض الأرز بمستوى إحلال ٦٠% وارتفاعها فى حالة الإحلال بمستوى ٣٠% وذلك مقارنة بمجموعة المقارنة.

يتضح من هذه الدراسة أنه يمكن إدخال مخلف تبييض الأرز فى علائق الحملان الأوسيمي بنسبة استبدال تصل إلى مستوى ٣٠% من مخلوط العلف المركز بدون حدوث أى تأثير سلبى على معدلات الزيادة فى وزن الجسم أو كفاءة التحويل الغذائى أو كمية ومواصفات اللحوم المنتجة وأن هذا الاستبدال يؤدى إلى خفض تكاليف التغذية وبالتالى يرفع الكفاءة الاقتصادية.