

Use of Rabbit Slaughtering Wastes as a Protein Source for Muscovy Ducks

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Abstract

The utilisation of rabbit slaughter waste (RSW) as a protein source for Muscovy ducks was studied as an example of integration within backyard systems.

Four groups of 33 Muscovy ducklings, 4 weeks old at the start, were used to compare a commercial mash with 3 other diets based on RSW given ad libitum, and corn, amounting to 25, 50, 75 % of the intake of the commercial mash (control). After a 6 week trial, the 50% and 75% corn + RSW groups showed a growth rate comparable to the control group, and only the animals receiving the lower amount of corn (25%) showed a reduced body weight in comparison to the control group (g 1841 vs. 2069). The lower growth rate occurred mainly during the first 4 weeks of the trial. Nevertheless compensatory growth was noted in the last 2 weeks.

The dressing percentages were similar to those of the control group for the 50 and 75% corn + RSW groups.

KEY WORDS: Rabbit, slaughter waste, Muscovy duck, integration.

Introduction

The complete recovery and utilisation of any kind of residue and waste is very important in backyard systems, which are the normal type of animal husbandry found in villages.

Slaughter waste from small animals is often available but unsuitable to feed to certain animal species. In backyard systems, this by-product is suitable for Muscovy ducks, which are commonly present in the villages of developing countries, and contribute to the rural economy as producers of meat and eggs.

The Muscovy duck is vigorous, resistant to common diseases, adapted to hot climates and, unlike other web-footed birds, is less demanding in terms of non-drinking water needs. It is an omnivorous species, able to graze and to utilise a wide variety of feed sources, and is known to particularly relish feeds of animal origin if given fresh.

The Muscovy duck is able to integrate with rabbit breeding for other reasons since they eat earthworms, grubs, insects and dropped feeds which they find among the rabbit droppings (Finzi and Amici, 1989). Rabbit slaughter waste (RSW) has been shown to be very profitably utilised (Gualterio *et al.*, 1988).

These considerations indicate that the use of RSW can favour the integration of rabbit and muscovy duck breeding, and contribute to improved backyard economics.

RSW is composed of gastro-intestinal tracts together with their contents. It is a by-product very rich in protein (35.4% CP in D.M.) and energy (calculated ME 4028 Kcal/Kg DM) (Leclerq and De Carville, 1978), the source of which is mainly fat (ether extract 26.3%; nitrogen-free extractive only 17.9%). It is therefore advisable to feed it together with grain, in order to balance the protein and energy. Some published data (Gualterio *et al.*, 1988), together with new results are reported here.

Materials and Methods

The experimental diets were based on corn, provided at 75, 50 and 25 percent of the consumption of a control mash fed ad libitum. The animals receiving corn were also fed ad libitum with hashed RSW.

The experimental feeds and the control commercial diet (table 1) were fed for six weeks to four groups of 33 ducklings from four weeks of age. The animals were bred in open-air enclosures of 40 m² with a roofed area of 3.5 m²

Table 1 Chemical composition and energy content of feeds (% DM)

	Control	Corn	RSW
Moisture	12.0	11.5	73.3
Crude protein	19.8	11.5	35.4
Crude fibre	7.3	2.1	10.9
Ether extract	3.6	4.7	26.3
Ash	8.2	1.8	9.5
NFE	61.1	79.9	17.9
ME Mj/Kg	13.2	16.5	16.5

A slaughter trial and a meat quality control, by a panel of eight judges, were performed at the end of the experiment. The following slaughter traits were measured: dressing percentage, liver, head and feet, empty gizzard, stomach and gut, and half breast.

Results

During the first week, when the animals in the experimental groups were not yet accustomed to eating RSW, the daily body weight gains were higher in the control group (table 2).

Thereafter, the two experimental groups (50% corn + RSW and 75% corn + RSW) began to grow better than the control up to 56 days of age. In the final 14 days, daily gains of these groups decreased according to the natural growth curve. Growth was significantly lower than control ($P < 0.05$) only for the 25% corn + RSW group.

The results show that RSW is a very good feed source which can easily balance a corn diet. In fact the two groups which received the highest percentage of corn (75% and 50%) achieved a final live body weight even higher than the control group (Table 2).

Table 2: Live body weight (g) at different ages (days)

	Days	28	42	56	70
Control	mean	475	846a	1474a	2069a
	sd	103.5	129.1	149.9	137.8
25 corn + RSW	mean	479	686b	1240b	1841b
	sd	127.0	143.7	207.8	198.0
50 corn + RSW	mean	498	801a	1520a	2132a
	sd	101.5	142.5	187.6	196.5
75 corn + RSW	mean	481	823a	1478a	2085a
	sd	103.8	128.3	208.0	197.7

ab- different letters in the same column indicate significant differences ($P < 0.05$).

The economic advantage is obvious, since corn is much cheaper than commercial feed and it can be utilised in an amount which is only half that of the mash necessary to obtain a normal growth rate.

The performance of the 25% corn + RSW group, which showed a lower final body weight (-11%, $P < 0.01$), is nevertheless interesting since this was achieved with reduced amounts of corn (25% of control feed consumption) and acceptable growth performance was obtained (table 3).

In this case, one week more was required to reach the same live weight as the other groups, but it must be stressed that, in developing countries, the saving in grain is much more important than obtaining a maximum growth rate.

In table 4, the average daily consumption of corn, RSW and commercial mash are analysed at different ages of ducklings. It must be stressed that, from day 28 to 56, corn consumption of the 75% corn + RSW group was 12-20% lower than the amount offered since RSW were strongly preferred. Feed conversion rates (DM) were very satisfactory for all the four groups (2.8, 2.9, 2.6 and 2.4 for control, RSW+75% corn, RSW+50% corn and RSW+25% corn respectively). These results indicate that diets with only two ingredients (corn and RSW) are possible. This is particularly important in developing countries where protein sources are difficult to find and commercial balanced feeds are not easily available.

Table 3: Live weight gain (g) at different ages (days)

	Days	28-42	42-56	56-70	28-70
Control	mean	26a	44ab	43	38a
	sd	7.9	8.9	7.5	6.8
25 corn + RSW	mean	15b	40b	43	32b
	sd	14.3	7.1	8.5	9.6
50 corn + RSW	mean	22a	51a	44	39a
	sd	9.8	7.9	6.5	7.2
75 corn + RSW	mean	23a	49a	43	38a
	sd	8.3	8.7	7.8	6.9

ab- different letters in the same column indicate significant differences ($P < 0.05$).

Table 4: Average feed consumption* (g) at different ages (days)

	Days	28-42	42-56	56-70	28-70
Control	total	65	112	138	105
25 corn + RSW	corn	17	25	33	38
	total	43	88	105	79
50 corn + RSW	corn	34	58	70	54
	total	61	112	125	99
75 corn + RSW	corn	42	68	103	71
	total	66	119	153	113

* group feeding

Dressing percentages, breast muscles and other slaughter cuts were unchanged in all the groups except for breast muscles of the 25% treatment which were 30% lower, owing to the lower live body weight (table 5).

Meat quality tests, performed on roasted meats, indicated that they were all very palatable, although a lower quality score was observed for the group with higher RSW intake (25% corn); this meat was also darker.

Table 5: Average dressing composition (g) of Muscovy ducks slaughtered at 70 days of age

		Viscera	Liver	Head foots	Dress- ing %	Right breast	Empty gizzard
Control	mean	133a	50	261	1162b	100a	67a
	sd	13.2	10.6	29.4	104.4	25.1	7.0
25 corn + RSW							
	mean	127a	41	235	1003c	71b	55b
	sd	8.6	3.4	24.3	96.7	19.1	6.2
50 corn + RSW							
	mean	157b	48	273	1256a	106a	66a
	sd	18.2	6.3	29.7	100.4	26.8	6.7
75 corn + RSW							
	mean	146b	46	268	1221a	104a	71a
	sd	18.7	8.7	32.3	60.7	20.7	5.7

ab- different letters in the same column indicate significant differences ($P < 0.05$).

Conclusions

Rabbit slaughter waste appears to be a very valuable feedstuff for Muscovy ducks bred in developing countries.

In particular, fresh RSW can effectively balance a corn diet, permitting very good growth performance in comparison with a specific commercial diet. The utilisation of the fresh by-product has the advantage of eliminating all the problems of drying and conservation, and allows a worthwhile saving in cereals. RSW utilisation is advisable mainly where and when local grain resources are poor.

The integration of rabbits and Muscovy ducks in rural backyard systems is a very simple and practical way to eliminate slaughter waste and to save on the use of corn.

These results also suggest the possibility of studying the introduction of slaughter wastes from other species in Muscovy duck feeding in backyard systems, particularly near to slaughter houses.

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