

Replacement of Rabbit Diet Containing Dried Rumen Contents Instead Some of the Barley Grain Used.

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SUN DRIED rumen contents with protein 11.1 % fiber 35.0 % ash 15.4 % and NFE 33.9 % were given in a diet for growing boussac rabbit for 12 weeks of age at the expense of barley with levels 0, 10, 20 and 30 %. Results indicated that dried rumen contents reduced digestibility of other ingredients in the diets. The average gain weight were 578, 519, 427 and 402 gm. for feed consumption the average were 563, 600, 572 and 646 gm and for feed conversion were 4.15, 5.30, 5.35 and 6.56 for control and other experimental diets containing 10, 20 and 70 % SDRC respectively.

SDRC at levels 20 and 30 % significantly decreased body weight, gain in weight and feed conversion, otherwise it has no effect on intake of feed.

It was concluded that the replacement 10 % of SDRC of barley to rabbit diets was suitable.

One of the major problems of rabbit feeding in summer, in Egypt, is the shortage and high cost of feed. Attempts has been made to use agricultural by products to provide unusual dietary ingredients as well as reducing pollution.

The nutritive value of dried rumen contents and its fractions has been tried for feeding poultry (El Deek *et al.*, 1975 ; El Deek, 1976 ; Emmanuel, 1978 and Reddy & Reddy, 1980). The rumen contents for cattle had an average weight of 36-45 kg (Sarbulescy *et al.*, 1980 and Kamphues, 1981). Moreover, apparent digestability ranged between from 22 to 39% (Jovanovic and Cuperiovic, 1977) and to 59% (Jansen *et al.*, (1981).

The studies reported herein were initiated to investigate the possibility of using the whole sun dried rumen contents to replace part of the barley in rabbit diets. The digestibility coefficient of tested material was estimated.

Material and Methods

The present experiments were carried out during the summer season of 1982 at the montazah Poultry Research Station and Faculty of Agriculture, University of Alexandria.

Preparation of rumen contents

The rumen contents were collected in large vessels. After slaughters of cows and buffaloes in Alexandria slaughter house. Rumen contents were dried by the sun heat for four days, then ground to small particle. Sample was finely ground for chemical analysis.

A total of forty Bouscat rabbits approximately 10 weeks old were divided according to weight into four major groups of 10 rabbits each. Each group was subdivided to two replicates each contained 5 rabbits which they were housed in a wired floor butch (100 × 100 × 100 cm).

The dried rumen contents were incorporated into the basal diet at the expense of barley with the percentage of 0, 10, 20 and 30% of the diets. Each major group was offered one of the four experimental diets included in (Tables 2). The chemical composition of sun dried rumen contents and barley were presented in Table 1.

TABLE 1. Proximate analysis and digestible nutrients of rumen contents and barley.

| Item | barley % | Rumen content% | D.C. of** SDRC |
|-------------------------|----------|----------------|----------------|
| Dry matter* | 91.62 | 91.27 | 66.91 |
| Crude protein | 10.40 | 11.08 | 67.90 |
| Crude Fiber | 5.28 | 35.01 | 11.30 |
| Ether extract | 2.65 | 4.66 | — |
| Ash | 5.03 | 15.38 | — |
| N.F.E. | 76.63 | 33.87 | 76.50 |
| D.E. Kcal/Kg | — | — | 3.310 |

* all values on dry matter basis.

** Digestibility coefficient of sun dried rumen contents.

The individual rabbits were banded. Feed and water were supplied *ad libitum*. The animals were observed daily and their weights were recorded at weekly intervals. Feed consumption was recorded biweekly and the feed conversion (gm weight gained/ gm feed eaten) was calculated. The experiment lasted for 12 weeks.

Analytical methods

Chemical analysis of the tested materials was carried out according to AOAC (1975). Analysis of variance (Snedecor and Cochran 1971) and the significance of differences between means were established by Duncan's test (1955).

Digestibility trials

Six healthy male rabbits, five months old, housed in individual batches were used. Three of them were fed on the basal diet (Table 2). The other three animals were fed on 80% basal diet plus 20% sun dried rumen contents. Chromic oxide was added to the rations as an inert index material. The procedure used to determine the chromic oxide content of the feed and faeces was described by Czarnocki *et al.*, (1961). Experimental period lasted for four days and was preceded by a preliminary period of 12 days during which no collection were made. Daily fecal from each rabbit was collected and taken in plastic bag, dried in an oven at 70° finely ground, then chemically analysed. The coefficient of digestibility was calculated by the following formula

$$\text{digestibility coefficient} = 100 - \left(100 \frac{\% \text{ indicator in feces} \times \% \text{ nutrient in feces}}{\% \text{ indicator in feed} \times \% \text{ nutrient in feed}} \right)$$

TABLE 2. Composition of control and experimental diets

| Ingredient | diet A % | diet B % | diet C % | diet D % |
|-------------------------------|----------|----------|----------|----------|
| Yellow corn | 26.00 | 26.00 | 26.00 | 26.00 |
| Barley | 50.00 | 40.00 | 30.00 | 2.00 |
| dried rumen content | 00.00 | 10.00 | 20.00 | 30.00 |
| Soybean meal | 20.00 | 20.00 | 20.00 | 20.00 |
| bone meal | 2.00 | 2.00 | 2.00 | 2.00 |
| limestone | 1.30 | 1.30 | 1.30 | 1.30 |
| salt | 0.50 | 0.50 | 0.50 | 0.50 |
| Vit and min. mix.* | 0.20 | 0.20 | 0.20 | 0.20 |
| <i>calculated composition</i> | | | | |
| protein % | 16.25 | 16.30 | 16.36 | 16.43 |
| fiber % | 4.14 | 6.86 | 9.56 | 12.28 |
| fat % | 2.41 | 2.59 | 2.77 | 2.96 |
| Ash % | 6.66 | 7.59 | 8.54 | 9.48 |
| N.F.E % | 59.93 | 55.99 | 52.06 | 48.13 |

* from super chick premix.

Results and Discussion

The chemical composition of sun dried rumen contents, (SDRC) and barley which were used in this study are presented in Table 1. The analysis showed that crude protein content and dry matter of sun dried rumen contents was similar to the barley. Ether extract, ash and fiber of (SDRC) was higher than that of barley while N.F.E. was lower. The (SDRC) contents were within the range reported by Krutyporokh *et al.*, (1977) Emmanuel (1978) and Reddy and Reddy (1980).

The average body weight of the tested growing rabbits as well as standard deviations during the experimental periods from 10 weeks up to the 22 weeks of age are shown in Table 3. The data indicate that rabbits fed the control diet (A) were higher in their weight than those fed on the experimental diets at the different experimental periods. However, the differences were not statistically significant between rabbits fed the experimental diets B, C and D which contained 10, 20 and 30% SDRC. Also, the differences were not significant between rabbits fed (diet A) control and (diet B) which contained 10% SDRC at 14, 18 and 22 weeks of age.

TABLE 3. Effect of different levels of sun dried rumen contents on weekly body weight of growing housecat rabbits.

| experimental weeks | diet A $\bar{x} \pm S.D$ | diet B $\bar{x} \pm S.D$ | diet C $\bar{x} \pm S.D$ | diet D $\bar{x} \pm S.D$ |
|--------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 10 weeks | 910 (258)* | NS 828 (205) | NS 760 (205) | NS 930 (250) |
| 12 weeks | 1213 (252) NS | 1100 (308) NS | 942 (222) NS | 1130(282) NS |
| 14 weeks | 1570 (233) | 1460 (292) | 1167 (255) | 1417 (363) |
| 16 weeks | 1896 (313) a | 1750 (343) ab | 1343 (336) a | 1588 (277) b |
| 18 weeks | 2128 (288) | 2031 (280) | 1617 (359) | 1684 (330) |
| 20 weeks | 2506 (380) a | 2258(315) ab | 1791(382) b | 1802 (375) b |
| 22 weeks | 2630 (367) | 2383 (336) | 2047 (356) | 2030 (313) |
| No. of rabbits | 9 | 10 | 10 | 9 |

diet A = control

diet B = 10% SDC

diet C = 20% SDRC

diet D = 30% SDRC

* values in parentheses = standard deviation

** values with different superscripts are statistically different.

Table 4 illustrate the body weight gain feed consumption and feed conversion ratio for the tested growing rabbits fed on diets containing different levels of SDRC at different ages. Through the growing periods the rabbits which were fed on the experimental diets tended to be less than controls and being about 10, 26 and 30% for diet B, C and D respectively. There was no significant differences between weight gains of rabbits supported with 20 and 30% SDRC as well as rabbits supported with 10 and 20%SDRC and between control group and those fed diets containing 10% SDRC. With the increases of age the gain weight decreased. The average gain for the first, second and third month of age were 446, 492 and 405 respectively and the analyses of variance showed significant differences between different ages.

The findings obtained partially agree with Jovanovic and Cuperovic (1977) who reported that daily weight gain for rats in 20 days was significantly less when fed on 24% dried rumen contents and in take was greater. Similary Cuperlovic *et al.* (1977) showed that diets with 30 to 60% of rumen contents and maize mixture gave lower weights about 1.5 kg when replaced fish meal and soybean meal in standard diets for chickens. On the other hand, Krutyporokh *et al.* 1977 showed that the level of 5-8% of rumen meal in diets for pigs supported the feeding value of the diets and increased productivity compared to control groups, furthermore, the pigs readily ate the diets with rumen contents.

Feed consumption of the experimental diets was not statistically significant ($P \leq 0.05$) for all the tested four diets. Intake of feed being about 7, 2 and 15% greater than that of control diet (A) for rations B, C and D respectively. With the age feed intake was increased. Analysis of variance showed significant differences between three periods.

Feed conversion ratio of rabbits fed different levels of SDRC replacing barley has been shown significant differences. However, there was no significant differences between rabbits offered 10 and 20% SDRC and those received control diet. It is interesting that with the increased age the feed conversion decreased and being about 28, 29 and 58% more than control group for diets B, C and D respectively.

Table 2 indicate that, the percentage of fiber content increased and the percentage of NFE decreased for the experimental diets as compared with the control diet containing SDRC. The depression in body weight gain and feed conversion for rabbits fed the experimental diets could be attributed to the diluted energy and some nutrients by inclusion of SDRC. In addition, the high fiber content and lower density of the experimental diets caused difficulty in feeding.

Our results are in agreements with Schaible (1970) Titus and Fritz (1971) and Emmanuel (1978). Who found that solid material of dried rumen content might resulted in the decrease of digestibility of other ingredients due to

TABLE 4. Performance of rabbits fed on diets containing different levels of sun dried rumen contents at different ages.

| Item/month | diet A x ± S.D | diet B x ± S.D | diet C x ± S.D | diet D x ± S.D | average ± S.D |
|---------------------------------|--------------------------|---------------------------|---------------------------|--------------------------|--------------------------|
| <i>Body weight gain (gm)</i> | | | | | |
| first month | 660 ± 148 | 632 ± 103 | 407 ± 103 | 487 ± 147 | 546 ± 119 ^{ab} |
| second month | 572 ± 156 | 572 ± 126 | 450 ± 174 | 374 ± 230 | 492 ± 97 |
| third month | 502 ± 201 | 352 ± 155 | 425 ± 138 | 346 ± 107 | 406 ± 73 ^b |
| Average ± S.D | 578 ± 79 ^a | 519 ± 147 ^{ab} | 427 ± 22 ^{bc} | 402 ± 75 ^c | |
| %* | 100 | 90 | 74 | 70 | |
| <i>Feed consumed gm/ animal</i> | | | | | |
| first month | 493 ± 58 | 498 ± 97 | 447 ± 118 | 563 ± 141 | 500 ^a ± 48 |
| second month | 540 ± 81 | 624 ± 161 | 557 ± 136 | 597 ± 137 | 579 ^b ± 38 |
| third month | 565 ± 69 | 679 ± 79 | 712 ± 63 | 780 ± 161 | 707 ^c ± 54 |
| average ± S.D | 563 ± 84 | 600 ± 93 | 572 ± 133 | 646 ± 117 | |
| % | 100 | 107 | 102 | 115 | |
| <i>Feed conversion</i> | | | | | |
| first month | 3.04 ± 0.18 | 3.15 ± 0.17 | 4.40 ± 0.18 | 4.72 ± 0.63 | 3.82 ^a ± 0.86 |
| second month | 3.79 ± 0.37 | 4.39 ± 0.45 | 5.09 ± 0.81 | 6.54 ± 2.35 | 4.95 ^a ± 1.18 |
| third month | 5.62 ± 0.28 | 8.36 ± 3.33 | 6.57 ± 1.11 | 8.42 ± 1.22 | 7.24 ^b ± 1.38 |
| average ± S.D | 4.15 ± 1.33 ^b | 5.30 ± 2.72 ^{ab} | 5.35 ± 1.11 ^{ab} | 6.56 ± 1.85 ^a | |
| % | 100 | 128 | 129 | 158 | |

* P, % values relative to that control rabbits (diet A).

** Each value is the average of ten values representing the rabbits in two replicates.

the fiber content of this material. Jovanovic and Cupriovic (1977) revealed that the apparent digestability of DM for dried rumen contents was 59%, while Jansen *et al.* 1981 reported that the digestibility in vitro for DRC was 22 to 39% as compared with the total digestible nutrients from barley 73%.

Although there was a tendency for mortality to be negligible between the groups.

The results showed the need for further investigation of the used of DRC in diets for rabbit.

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احلال محتويات كرش الحيوانات بدلا من جزء من الشعير المستخدم في أعلاف الارانب النامية

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تم اجراء هذه الدراسة على عدد ٤٠ أنثى بوسكات ناميا لمدة ١٢ أسبوعا .
استخدمت في هذه الدراسة محتويات الكرش للحيوانات المجترة المجففة شمسيا
و ذات التركيب الكيماوى ١١١٪ بروتين ، ٣٥٪ ألياف ، ١٥٥٪ أملاح و ٣٣٩٪
سكريات ذائبة وأدخلت هذه المحتويات فى أعلاف الارانب على حساب الشعير
بمعدلات صفر ، ١٠ ، ٢٠ ، ٣٠٪ .

أظهرت النتائج أن محتويات الكرش تقلل من معاملات الهضم للعناصر
الغذائية المختلفة وذلك لمحتواها المرتفع من الألياف .

كانت متوسط الزيادة فى الوزن ٥٧٨ ، ٥١٩ ، ٤٢٧ ، ٤٠٢ جم ولا يستهلك
العلف ٥٦٣ ، ٦٠٠ ، ٥٧٢ ، ٦٤٦ جم أما معامل تحويل العلف فكان ٤١٥ ،
٥٣٥ ، ٦٣٥ ، ٦٥٦ وذلك للمليقة الكنترول وكذلك الأعلاف المحتوية على
١٠ ، ٢٠ ، ٣٠٪ من محتويات الكرش على التوالى .

كانت الاختلافات جوهرية لوزن الجسم والزيادة فيه ومعامل تحويل الغذاء
(عند مستويات ٢٠ ، ٣٠٪) بينما كان استهلاك العلف غير جوهرى .

يمكن القول من هذه الدراسة أن ١٠٪ من محتويات كرش الحيوانات فى
أعلاف الارانب النامية يعتبر مناسبيا .