# FEEDING GROWING FLEMISH GIANT RABBITS

## II. –Feeding on Clover and Concentrates Containing Undecorticated Cotton Seed Cakes

*By*

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### SUMMARY

A study was made on growing Flemish giant rabbits fed on berseem (Egyptian clover) alone or long with two levels of a concentrate mixture containing 60% barley grains, 30% wheat bran and 10% undecorticated cotton seed cakes. Better growth was achieved when clover was mixed with concentrates with a reduction in the growth measure particularly when the ration contained 50%of its starch value as clover. The cotton seed cake was introduced with the concentrates along with clover without any harmful effect on the growing rabbits.

### INTRODUCTION

In Egypt, clover (*Trifolium alexandrinum*) is the main food for farm animals in winter. It can cover, however, their need for maintenance and production. The price of berseem is low in the northern parts of the Delta while it is high in other places and around cities. It is usually expensive to feed rabbits solely on berseem around cities. Experiments carried out by Ghoneim and his assistants showed better feeding results from combining clover with concentrates for feeding growing cattle and sheep (1, 2).

In a prerious paper on feeding Flemish giant rabbits on different levels of clover and a concentrate mixture containing barley grain and wheat bran,it was found that mixing clover with concentrates produced better growth with higher efficiency in food utilization than either clover alone or concentrates alone. Feeding on concentrates alone produced distinctly slow growth and was associated with mortality and decreased appetite.

Cotton seed cakes, as a cheep item, is used nowadays mainly as a protein source for feeding farm animals and to replace beans which is used by human-beings. Ghoneim introduced cotton seed cakes in feeding animals and poultry in Egypt (3, 4).

Cotton seed meal may be fed to hogs to the extent of 9% of the total ration (5). Cotton seed meal is toxic when given as a sole concentrate; it is a good source of potassium and phosphorous but it is

deficient in calcium and carotene (8). Wheat bran is valuable in the ration for all classes of rabbits. The common grains (such as barley and maize) are low in calcium.

Hale *et al* (5) found also that high quality cotton seed meals containing not more than 0.04% free gossypol was safely given to growing pigs to supply 25% of the crude protein in the diet. A satisfactory ration was obtained by adding cotton seed meal to good hays or pasture herbage.

Therefore, this work was undertaken as confirmatory of previous results and to introduce undecorticated cotton seed cake in the concentrate mixture.

## EXPERIMENTAL AND METHODS

### *Animals*

Flemish Giant rabbits from the Experiment Station of the Animal Nutrition Section Faculty of Agriculture, Giza, were used starting on on 8/4, 1959.

Animals were divided into 3 groups of the same age. The rabbits were 8.7 and 7 in Group A, B and C respectively. The daily ration and residue were recorded. Berseem offered was chopped so that rabbits would eat leaves and stems. The experiment started at 8 weeks old and continued for 8 weeks.

### *Feeding*

The daily consumption as starch value during the successive weeks followed very approximately the figures recorded by Touny (7). The concentrated ration contained 60% barley, 30% wheat bran and 10% undecorticated cotton seed cakes ; the starch value of the mixture was 69.7% and the digestible protein was 9 %. Feeding was as follows :

Group A was fed solely on berseem as a control group. Group B was fed on clover : concentrate mixture containing 33% of the total starch value from clover and 67% from concentrates. Group C was fed on a 50 : 50% clover : concentrate mixture. The daily starch value eaten is recorded in Table 1 of the results.

The average weight per rabbit in each group was recorded weekly before receiving the morning ration at 8.a.m. to the nearest gram.

## RESULTS AND DISCUSSION

### A.—*Average initial and final weight*

The average weight of the 8 weeks old rabbit at the start of the experiment for Groups A, B and C was 1.000, 1.230 and 1.028 kg. respectively (Table 1). At the end of the experimental period (16 weeks) the respective average weight of the rabbit was 1.410, 1.900 and 1.750 kg. The respective calculated percentage of the final weight from the initial was 141.0, 154.5 and 184.8. This clearly shows that the ration of Group C (50% clover + 50% concentrates) surpassed the other two rations of Group A and B which produced lower growth : Introducing undecorticated cottonseed cakes appeared not to have any harm effect on the growth of the rabbit. Results were similar to those already obtained by the authors (6) without adding the cotton seed cake.

### B.—*Gain in weight during the whole experimental period*

As shown in Table 1, the average gain in the rabbit during the experimental period (8-16 weeks) was 412, 670 and 872 grams for Group A, B and C respectively. This indicates that higher growth was achieved when adding concentrates to the ration. The best results were obtained when clover conslituted 50% of the starch value of the offered ration.

### C.—*Relation between average weekly weight and age*

A significant linear regression of the average weight on age was found with the 3 groups ; the following equations were obtained :

Group A $W_1 = 57.5\ T + 567.7$

Group B $W_2 = 83.0\ T + 530.0$

Group C $W_3 = 91.3\ T + 390.0$

Where W = the calculated weight in grams at the age T in weeks during the period 8 - 16 weeks.

This means that the statistical average for the weekly rate of growth was 57.5, 83.0 and 90.3 gm. with Group A,B and C respectively. Therefore, the rabbits fed on clover and concentrates grew faster than the control rabbits fed on clover alone. The ration containing 50% clover was better than that containing 33% clover confirming previous results. (6)

## D.—*Growth Measure and efficiency of food utilization*

Growth measure (the number of starch value units needed to produce a unit increase in body weight) was applied as a function of food efficiency.

TABLE 1.—**Effect of feeding Flemish Giant rabbits on different levels of clover and concentrate mixture containing undecorticated cotton seed cake during the growth period 8-16 Weeks old. The concentrate mixture contains 60% barley grains, 30%wheat bran and 10% undecorticated cotton seed cake.**

| Age in weeks (T) | Group A 100% clover | | Group B 33% clover 67%concentrates | | Group C 50% clover 50%concentrates | |
|---|---|---|---|---|---|---|
| | Weight of rabbit W | Starch value eaten/day S.V. | W. | S.V. | W. | S.V. |
| | gm. | gm. | gm. | gm. | gm. | gm. |
| 8 | 1000 | — | 1230 | — | 1028 | — |
| 9 | 1050 | 38.7 | 1283 | 36.3 | 1214 | 42.5 |
| 10 | 1125 | 47.0 | 1330 | 50.6 | 1343 | 49.3 |
| 11 | 1200 | 47.4 | 1430 | 50.6 | 1470 | 49.3 |
| 12 | 1340 | 58.8 | 1530 | 61.8 | 1570 | 49.3 |
| 13 | 1412 | 58.8 | 1614 | 61.8 | 1586 | 61.4 |
| 14 | 1385 | 59.5 | 1657 | 61.8 | 1657 | 62.8 |
| 15 | 1412 | 50.6 | 1770 | 61.8 | 1770 | 62.8 |
| 16 | 1412 | 50.6 | 1900 | 61.8 | 1900 | 62.8 |
| Total gain, kg. | 0.412 | | 0.670 | | 0.872 | |
| Total starch value eaten, kg. | 2.880 | | 3.126 | | 3.083 | |
| Starch value/kg. live weight (kg. S.V.) | 6.990 | | 4.665 | | 3.537 | |

The growth measure during the whole period for the three groups respectively was found to be 6.990, 4.665 and 3.537. Using the food efficiency index for relative comparison those figures would be 197, 131 and 100, indicating that the ration of group C was the best followed by that of Group B.

Therefore, it is advisible in practice to feed rabbits on clover along with concentrates in order to reduce feeding cost via the reduction in feed units for unit production. If clover is dear or not abundant, a daily diet can be used containing 33% or 50% clover and then com pleted with concentrates. The 50% clover mixture is more recomm-ended. If berseem is abundant and cheap, it can be used alone so long the feeding cost of unit production would be less than when mix-ing with concentrates which might be dear or scarce. Addition of 10% undecorticated cotton seed cake in the concentrate mixture would also reduce feeding cost.

## E.—*Mortality*

There was no mortality among the experimental groups. Hence, undecorticated cotton seed cakes could be safely introduced at a ratio of 10% of the concentrate mixture.

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# تغذية أرانب فلمش جاينت النامية

## ٢ ـ التغذية على البرسيم ومخلوط مركز يحتوى على كسب القطن غير المقشور

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## الملخص

درس تأثير تغذية الأرانب من سلالة فلمش جايت على البرسيم وحده ، أو مع مستويين مختلفين من مخلوط عليقة مركزة تتكون من ٦٠٪ حبوب الشعير ، ٣٠٪ نخالة قمح ، ١٠٪ كسب قطن غير مقشور وقد وجد نمو أحسن عند التغذية على البرسيم مع العليقة المركزة مع تخفيض فى مقياس النمو ( وحدات النشا المهضوم اللازمة لانتاج وحدة نمو ) ، خاصة عندما كان البرسيم يبلغ ٥٠٪ من القيمة الغذائية للعليقة اليومية كنشا مهضوم .

وقد أمكن اضافة كسب القطن المقشور بهذه النسبة فى مخلوط العليقة المركزة دون أى تأثير ضار على الأرانب النامية .