OPTIMAL FEEDING LEVELS FOR SOME STRAINS OF RABBITS AND THEIR CROSSES UNDER INTENSIVE MEAT PRODUCTION CONDITIONS

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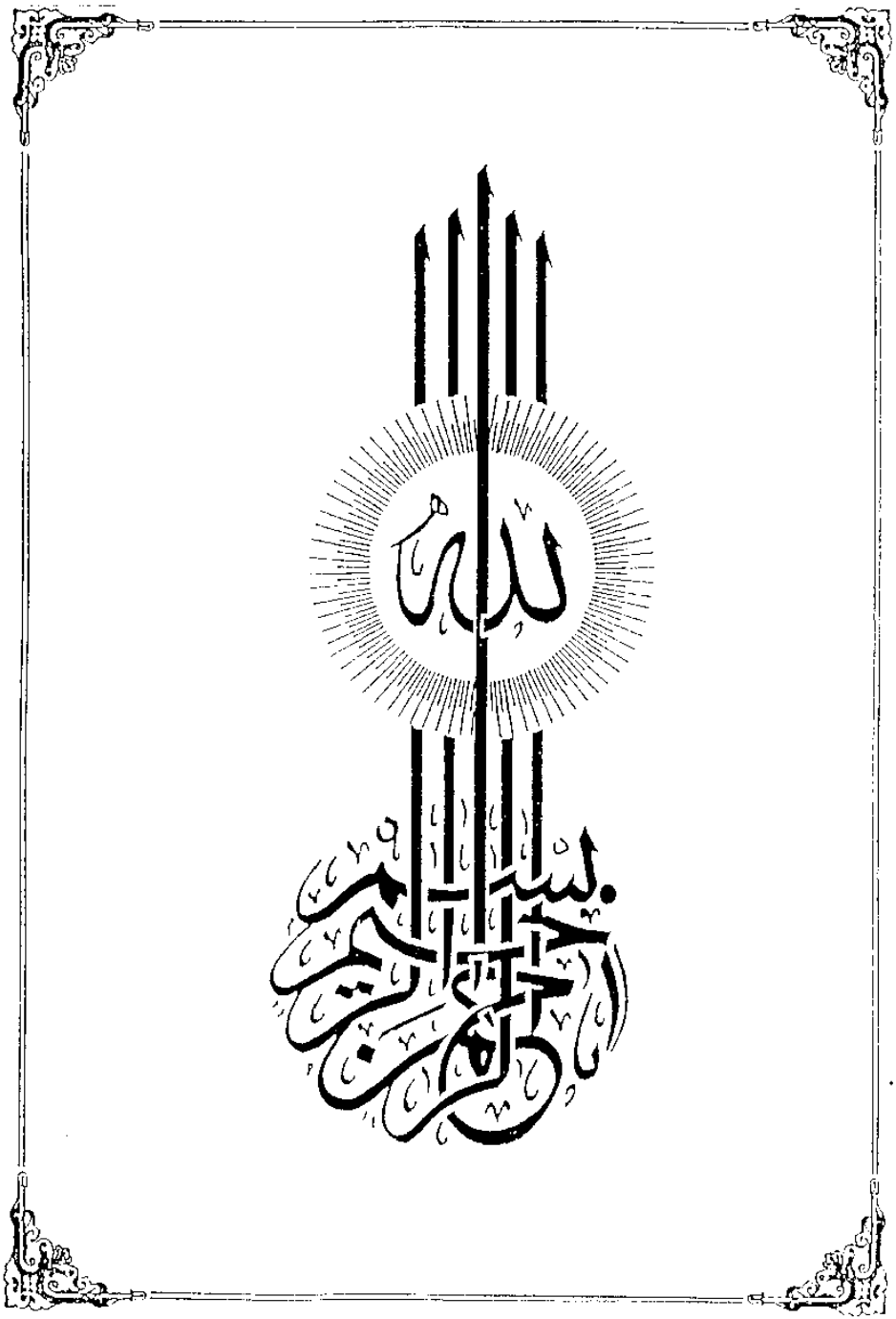

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INTRODUCTION

Programs of intensive rabbit production have recently been developed in Egypt with increasing numbers of females and of different breeds namely : medium and light. Heavy breeds seemed to need more time to be developed in commercial farms in Egypt.

The knowledge we have about the nutritional needs of rabbits under local conditions was basid on local breeds as well as normal average production.

Intensive production has been recently practiced allover many countries which developed both breeds and technical procedures for this type of production.

The nutrition requirements of does of different strain under intensive production seemed to differ greatly from those under the conventional way.

This work was designed therefore to study the total protein requireqment in isocaloric rations in the hope of fulfilling the mother's optimal needs during the physiological status of both lactating and pregnancy.

The growth requirement of both protein and energy for the strains and their crosses was also studied

using the same two levels of total protein along with other two different levels of digestible energy up to marketing weight.

The idea being to achieve the best calorie; protein ratio in the starting ration for weaned animals.

REVIEW OF LITERATURE

A. Nutritional Requirements of the does :

1. Protein requirements of rabbits :

There is little information in the literature on the response of does to varying crude protein and energy levels during various phases of the reproductive cycle.

Sanchez et al., (1985) reported that, information on optimal crude protein (CP) requirement are needed to increase production, and efficiency of rabbits.

Reddy et al., (1980) found that, for New Zealand white does, the number of litters and of weaned rabbits tended to be greatest with diets contained 20% rather than 16% crude protein for a period of 4 breeding cycles.

Auxilia and Masoero (1981) found that, with two groups of New Zealand white does, given a complete pelleted mixture with crude protein 18% during pregnancy, and 22% during lactation or 18% throughout the cycle, fuetal mortality was more and fertility was less in does given more protein during lactation due to an undesirable extra growth.

Omole (1983) stated that, daily given of body weight and feed efficiency of females were significantly greater with 18% crude protein. The length of gestation

averaged up to 33.7 days with 10 or 14% protein in diet and incidence of births and mortality were greater. The numbers born and weaned per litter were less than those on the 18% crude protein.

Yono et al., (1986) found that, gestation period and litter interval did not differ among treatments with a 21.5% CP, 16% CP + 0.3% DL-methionin or 16% CP.

Barge et al., (1983) stated that during 4 reproductive cycles with a diet contained 20.03 or 18.80%crude protein, 5.66 and 3.59% fats, mean fertility were 48.9 and 44.0%, time between partnrtions 56.9 and 63.4 days and young litters 7.52 and 7.57. Mortality of young to 21 days old were 13.7% and 36.0% and to weaning 15.7 and 37.8%. During the first 3 weeks of lactation feed intake by does were 7416 and 6519 g, and live weight gain 360 and 206 g; litters weight were 2478 and 1859 g., respectively.

Adams (1983) indicated that, there were no significant differences between the groups in body weight size or colour of the vulva, mating behaviour, pregnancy rate or newnatale mortality of young for rabbits which were reared on a high protein diet (18%) and transferred to a diet with a low protein : energy ratio. With Towng Borgogne rabbits were fed on complete pelleted feeds with 15% protein during lactation and 11% during pregnancy or with 20% during the whole

.le, Santoro et al., (1968) found that, no significant difference between daily intake.

Halga (1980) found that, digestibility of nutrients did not vary much with breed and digestibility of dry matter, crude protein, ether extract, crude fibre and non-nitrogen extract from gestation to lactation. Digestible energy was in the same trend.

Yono et al., (1986) reported that, 16% CP diet with no cereal grain and no soybean meal can support normal growth and reproduction of commercial meat rabbits (New Zealand white rabbits).

Short et al., (1966) reported that, the amount of feed had no effect on number of live embryoes or survival of embryos.

Lukefahr et al., (1983) reported greater longevity of does fed higher protein levels.

Sanchez et al., (1985) used 3 levels of crude protein (17.5, 19 and 20%) to study the effect of dietary crude protein level on the reproductive performance of New-Zealand rabbits. They found that, no differences were observed for does, weight at kindling, percentages fertility, litter size, preweaning litter mortality, total born tended to be

higher on higher protein levels but percentage born alive was greatest on the 17.5%CP diet and mortality was highest for litters fed 20.5% CP.

Partridge and Allan (1982), found that, there was no effect of diet containing 135, 175 and 210 g crude protein per kg dry matter on milk composition, pup birth weight or litter size.

Partridge et al., (1986) found that, milk yields and composition were similar for lactating and concurrently pregnant and lactating does in early and mid-lactation, but in late lactation the milk out-put from concurrently pregnant and lactating does declined rapidly. This was the period of maximal fetal growth rates.

Growth and reproductive performance were compared by Adams (1983), in 125 rabbits which were reared on a high-protein diet (18% CP) and transferred to a diet with a low protein/energy ratio for 3-4 wk. prior to mating or from 4 wk. prior to mating until parturation, or given diet 18% throught the experiment.

Boyd (1985) reported that, maternal growth during gestation fitted a linear model and the mean weight increase

was 8.2 g/day. Growth of females during gestation was not directly related to litter size.

N.R.C. (1977) stated that, the 12% crude protein requirement for maintenance of does while 15 and 17% crude protein for gestation and lactation but not for the physiological status of them both.

2. Energy requirements :

There is a lack of information on energy requirements for does during various phases of reproductive cycle; non-pregnant, pregnant, lactating or concurrently pregnant and lactating.

Worcester et al., (1975) found that, body-weight was not influenced by the type of dietary carbohydrate. Meanwhile Partridge and Allan (1982) reported that, high content of maize starch, perhaps make the diet less palatable.

Partidge et al., (1986) found that, energy and nitrogen retention increased in pregnant and concurrently pregnant and lactating does in late pregnancy. They found that regression analysis was carried out to summarize the relation between metabolisable energy intake (MEI) and energy retention (ER, MEI-heat loss) in each four physiological status. All variables were expressed in kj/kg body weight$^{0.75}$ per day and were 208, 224, 441 and 387 for non-pregnant,

pregnant, lactating and concurrently pregnant and lactating, respectively.

The requirements of rabbits as given in the N.R.C. (1977) for gestation and lactation were 2500 (K cal) digestible energy while it was 2100 for maintenance.

On the other hand, most rabbits feeds contain about 9 Mj[(a)]/kg metabolisable energy and metabolisable energy (MC)[(b)] values as determined for poultry have been used. (Commercial Rabbit Production, 1978).

De Blas and Galvez (1975) by using the compartive Slaughter technique, found that, energy retention for the Giant of Spain breed (mature weight 4 to 4.5 kg) over the six 10-day periods was 10.7, 26.5, 39.0, 48.9, 72.6 and 57.3 k cal/day and energy content per unit of weight increase was 5.18, 5.52, 5.47, 5.80 and 5.89 k cal/g and deposition of protein (N x 6.25) was 1.45, 3.09, 4.28, 5.56, 7.31 and 5.44 g/day. The regression of the empty body weight (g) was : Y = 1.734 x -88.536 with a coefficient of regression of 0.97.

Twenty five californian does were mated and given pelleted diets of either 8 (LE) or 10 (HE) MJ/kg dry matter (ruminant metabolisable energy values) throughout gestation and lactation.

(a). Megajoule (MJ) = 1000 joule, joule (J) = 4.2 K cal.

(b). Megacalorie (MC) = 1000 kilocalories (K cal).

Butcher et al., (1983) found that, diet had no effect on litter size or birth weight, but does on the LE diet had lower live weight post partum ($P < 0.05$). Dry matter consumption by the does on the LE diet was greater than for the HE diet both during gestation and lactation, but calculated metabolisble energy intaks were lower during lactation.

In pregnant and lactating does, the value of 2200 k cal ME was found by Sabbra (1984) to be most suitable to fulfil the energy requirement of such physiological status.

3. Feeding systems :

Feeding systems had some effects on reproductive performance in rabbits as found by Parigi-Bini et al. (1983). These authors reported that, during first pregnancy in summer 3 groups of about 20 female rabbits, initially weighing about 3.5 kg at 125 days old, were given a standard pelleted diet to appetite or 30 or 65% of that amount (180 or 150 g daily). In a similar experiment in winter 2 groups of about 30 rabbits were given the feed to appetite ad lib or 30% of that amount (200 g daily). Mean daily gain values were 27.3, 24.9 and 20.5g in the 1st experiment, and 21.7 and 19.0 g in the 2nd experiment, respectively. Number of youngs per litter was 8.62, 10.05 and 9.05 for summer and 9.10 and 8.67 for winter. Number of live youngs was 8.33, 9.20 and 7.14 and 8.10 and 8.32 for the two seasons. Number of youngs 15 days after parturition