

Utilization of tropical forages and alfalfa meal by rabbits

P.R. Cheeke*, D.J. Harris and N.M. Patton

OSU Rabbit Research Center, Oregon State University, Corvallis, OR 97331, USA

*To whom correspondence should be addressed

The productive performance of rabbits was evaluated on diets of alfalfa meal and tropical forages. The results showed that rabbits can utilize high forage diets with little or no cereal grain. Several tropical legumes (*Desmodium distortum*, *Macroptilium lathyroides*, *Clitoria ternata* and *Cassia tora*) have the same feeding value for weanling rabbits as alfalfa meal. Rabbits have potential as meat producing animals when fed high roughage diets under tropical and subtropical conditions.

Die produksieprestasie van konyne is ondersoek op rantsoene van lusernmeel en tropiese voergewasse. Die resultate het getoon dat konyne hoë vesel diëte met min of geen graanmeel kan benut. Verskeie tropiese peulplante (*Desmodium distortum*, *Macroptilium lathyroides*, *Clitoria ternata* en *Cassia tora*) was gelykstaande aan lusernmeel wat voedingswaarde vir gespeende konyne betref. Konyne het potensiaal as vleisproduserende diere wat hoë ruvoer diëte gevoer kan word onder tropiese en subtropiese toestande.

Keywords: Rabbits, tropical forages, alfalfa meal

Introduction

Rabbits have considerable potential as meat-producing animals in the subtropics and tropics. They have a rapid growth rate, a high reproductive rate and can be fed on high roughage diets (Cheeke, 1980). They are suitable for raising on a small scale in developing countries to produce food from forages and by-products that otherwise might not be used (McNitt, 1980). The objectives of the present study were to evaluate the productive performance of rabbits fed diets high in alfalfa meal and tropical forages.

Materials and Methods

In Trial 1, alfalfa meal levels of 20, 70, 74, 78, 82, 86 and 90% were incorporated into pelleted diets and fed to growing rabbits. There was no cereal grain in any of the diets except the 20% alfalfa diet which had 54% maize. Ten weanling New Zealand White (NZW) rabbits were assigned to each treatment and growth was measured for 28 days. In Trial 2, five mature NZW does were assigned to either a low (28%), medium (54%) or high (74%) alfalfa diet and were fed the diets through breeding, gestation and lactation for two parities. In Trial 3, tropical forages were evaluated, including legumes, cassava and guinea grass. Growth, feed conversion and nutrient digestibility were measured with 10 NZW weanling rabbits per treatment.

Results and Discussion

In Trial 1, average daily gains (ADG) did not differ significantly among treatments (Table 1). Feed conversion was better ($P < 0,05$) with the 20% alfalfa level. The results indicate that high roughage diets can be utilized by growing rabbits for efficient meat production. Even with 90% dietary alfalfa, the feed conversion compared favourably with efficiencies commonly observed with swine on high grain diets (ca. 3,0).

Table 1 Performance of rabbits fed various levels of alfalfa in Trial 1 (n = 10 per treatment)

| % alfalfa | Av. daily gain (g) | Av. daily feed intake (g) | Feed/gain |
|-----------|--------------------|---------------------------|-----------|
| 20 | 39,1 | 99 | 2,57 |
| 70 | 39,0 | 132 | 3,40 |
| 74 | 36,3 | 124 | 3,64 |
| 78 | 36,7 | 128 | 3,39 |
| 82 | 40,8 | 144 | 3,55 |
| 86 | 38,8 | 142 | 3,75 |
| 90 | 35,9 | 135 | 3,78 |

In Trial 2, reproductive and growth responses in general were best for the medium (54%) alfalfa level (Table 2). Mortality from enteritis was highest with the lowest alfalfa level. The higher mortality with the high grain diet is probably a result of carbohydrate overload of the hindgut (Cheeke & Patton, 1980), with the proliferation of pathogens such as *Clostridium perfringens* (Patton *et al.*, 1978). These data indicate that high roughage diets can be successfully used

Table 2 Performance of female rabbits and their offspring fed diets with various alfalfa levels in Trial 2 (n = 5 per treatment)

| % dietary alfalfa | No. alive at 21 days | Av. litter wt. at 21 days (g) | Av. litter wt. at 56 days (kg) | % mortality (0-56 days) |
|-------------------|----------------------|-------------------------------|--------------------------------|-------------------------|
| 28 | 8,0 | 2812 ^a | 8,13 ^a | 41,8 |
| 54 | 10,7 | 3075 ^a | 13,67 ^b | 20,2 |
| 74 | 8,0 | 2313 ^b | 10,54 ^c | 23,2 |

^{a,b,c}differ at $P < 0,05$

Table 3 Performance of weanling rabbits fed diets containing tropical forages and nutrient digestibility in Trial 3 (n = 10 per treatment).

| Forage | Average daily gain (g) | Feed/gain | % digestibility | | |
|---------------------------------|------------------------|-----------|---------------------|-------------------|---------------------|
| | | | Crude Protein | ADF | CWC |
| Alfalfa meal | 39,9 ^a | 2,94 | 79,9 ^a | 29,0 ^a | 22,6 ^a |
| <i>Desmodium distortum</i> | 45,1 ^a | 2,62 | 76,6 ^a | 20,8 ^a | 24,3 ^a |
| <i>Macroptilium lathyroides</i> | 40,6 ^a | 2,98 | 71,0 ^{a,c} | 21,5 ^a | 13,5 ^b |
| Cassava leaf meal | 31,5 ^b | 3,22 | 59,5 ^b | 6,0 ^b | 16,1 ^{a,b} |
| <i>Stylosanthes guinensis</i> | 31,7 ^b | 3,62 | 68,3 ^c | 27,7 ^a | 21,2 ^a |
| Winged bean | 31,8 ^b | 3,43 | 67,5 ^c | 24,7 ^a | 20,8 ^a |
| <i>Clitoria ternata</i> | 32,3 ^b | 2,34 | 71,1 ^{a,c} | 24,5 ^a | 29,5 ^a |
| <i>Cassia tora</i> | 34,0 ^b | 3,02 | 68,7 ^{a,c} | 25,5 ^a | 22,9 ^a |
| Guinea grass | 29,3 ^b | 3,65 | 73,8 ^{a,c} | 1,5 ^b | 5,0 ^c |

^{a,b,c}differ ($P < 0,05$)

for reproducing rabbits, and may aid the prevention of enteric diseases.

In Trial 3, ADG of several tropical legumes was the same as that obtained with alfalfa (Table 3). Gains with guinea grass, cassava, stylosanthes and the winged bean were lower than with alfalfa. Digestibility of the protein and fibre (ADF, CWC) fractions was lower for some of the tropical forages than for alfalfa meal, while the digestibility of some of the tropical legumes was the same as alfalfa. The results indicate that several tropical forages could be utilized effectively in rabbit production.

In conclusion rabbits can utilize high forage diets with little or no cereal grain. Several tropical legumes had the same feeding value as alfalfa meal for weanling rabbits. Rabbits have potential as meat-producing animals fed high roughage diets under tropical and subtropical conditions.

References

- CHEEKE, P.R., 1980. The potential role of the rabbit in meeting world food needs. *J. Appl. Rabbit Res.* 3(3), 3-5.
- CHEEKE, P.R. & N.M. PATTON., 1980. Carbohydrate overload of the hindgut — a probable cause of enteritis. *J. Appl. Rabbit Res.* 3(3), 20-23.
- McNITT, J.I., 1980. The rabbit as a domestic meat source in Malawi. *J. Appl. Rabbit Res.* 3(3), 5-11.
- PATTON, N.M., H.I. HOLMES, R.J. RIGGS, & P.R. CHEEKE., 1978. Enterotoxemia in rabbits. *Lab Anim. Sci.* 28, 536-540.