

Preliminary results of the effect of dietary energy and protein levels on the production of female breeding Ostriches

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Introduction

Limited information is the main reason for the ineffective feeding of ostriches during the breeding season. The trend in the past was to feed breeding female ostriches diets with high energy and protein levels to elevate production, but this had the opposite effect. The aim of this study was determine production responses to different levels of protein and energy in breeding ostriches.

Materials and Methods

The experimental birds used in the study were obtained from the commercial ostrich breeding flock at the Klein Karoo Agricultural Development Centre near Oudtshoorn. The management of the breeding flock and the treatment of the eggs were described by Van Schalkwyk *et al.* (1996). Van Schalkwyk *et al.* (1998) described the collection and subsequent treatment and incubation of eggs. Ninety pairs of adult breeding ostriches were randomly divided into nine groups of ten pairs per group. Birds were fed dietary energy levels of 7.5 MJ/kg, 8.5 MJ/kg or 9.5 MJ/kg and protein levels of 10%, 12% or 14% during the breeding season (June–January). The formulation and composition of the diet is given in the accompanying abstract (Brand *et al.*, 2000a) on male breeders. Measurements were done at the onset and at the end of the breeding season.

Results and Discussion

Table 1 The effect of dietary energy levels on the production of female ostriches (mean ± SE)

Measurement	Energy level (MJ/kg)			Level of significance (P)
	7.5	8.5	9.5	
Starting mass (kg)	119.9 ± 2.9	116.5 ± 2.9	117.7 ± 2.9	0.678
End mass (kg)	95.7 ± 2.6 ^a	102.1 ± 2.6 ^b	103.9 ± 2.6 ^b	0.065
Mass change (kg)	-24.2 ± 1.9 ^a	-14.4 ± 1.9 ^b	-13.8 ± 1.9 ^b	0.001
Egg production (n)	38.1 ± 4.0 ^a	50.9 ± 4.0 ^b	55.2 ± 4.0 ^b	0.009
Chicken production (n)	21.1 ± 3.2 ^a	22.7 ± 3.2 ^a	33.1 ± 3.2 ^b	0.016
Infertile eggs ⁺	20.6 ± 4.2	26.8 ± 4.2	15.5 ± 4.2	0.144
Embryonic deaths ⁺	18.7 ± 2.3	20.1 ± 2.3	19.5 ± 2.3	0.894
Live chicks hatched	54.9 ± 4.5	45.3 ± 4.5	57.2 ± 4.5	0.124

⁺Expressed as a percentage of total egg production; ^{a,b} Row means with different superscripts differ.

Main effects only are presented, as no significant interactions were observed. The starting mass of the birds did not differ significantly between dietary treatments. The end mass for the 7.5 MJ energy level and 10% protein level differed significantly ($P \leq 0.05$) from that of the 8.5 MJ and 9.5 MJ energy and 12% protein level. The egg production results show a significant difference ($P < 0.05$) between the lowest energy level of 7.5 MJ and that of the 8.5 MJ and 9.5 MJ level. There was no significant difference in egg-production between energy levels 8.5 MJ and 9.5 MJ or between the different protein levels. A significant difference ($P < 0.05$) was found in chicken production between energy levels 7.5 MJ, 8.5 MJ and that of energy level 9.5 MJ. The different levels of protein had no effect on the egg-production or chicken production. Neither the energy levels nor the protein levels of the diets had any significant effect on infertile eggs, embryonic deaths or live chicks hatched.

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Table 2 The effect of dietary protein on the production of female ostriches (mean ± SE)

Measurement	Protein, %			Level of significance (P)
	10	12	14	
Starting mass (kg)	120.5 ± 2.8	115.7 ± 2.8	117.9 ± 2.8	0.473
End mass (kg)	105.1 ^a ± 2.6	97.7 ^b ± 2.6	99.1 ^{ab} ± 2.6	0.089
Mass change (kg)	-15.4 ± 1.9	-18.1 ± 1.9	-18.8 ± 1.9	0.419
Egg production (n)	50.5 ± 4.0	43.8 ± 4.0	49.9 ± 4.0	0.413
Chicken production (n)	28.9 ± 3.2	20.4 ± 3.2	27.6 ± 3.2	0.121
Infertile eggs ⁺	21.4 ± 4.2	22.3 ± 4.2	19.2 ± 4.2	0.864
Embryonic deaths ⁺	19.8 ± 2.2	22.2 ± 2.2	16.2 ± 2.2	0.180
Live chicks hatched ⁺	53.2 ± 4.5	47.2 ± 4.5	56.8 ± 4.5	0.320

⁺ Expressed as a percentage of total egg production; ^{a,b} Row means with different superscripts differ significantly

Conclusion

Egg-production and chicken production were significantly lower on the lower energy levels. These preliminary results indicate that 7.5 MJ is the minimum energy level. Egg-production and chicken production were not affected by protein level.

References

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