Substitution of soyabean meal with *Moringa stenopetala* leaf meal positively influenced feed consumption and egg production

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Introduction

- Poultry farming is eco-friendly with little impact on the environment.
- Poultry meat and eggs are good sources of high-quality protein for rural communities.
- One of limiting factors in poultry nutrition in tropics is high cost of protein sources.
- So, searching for low-cost protein sources is justifiable.
- *Moringa stenopetala* is a multi-purpose tree endemic to southern Ethiopia.
- Its leaf has been identified as potential protein source for poultry.
- Research objective: evaluate the efficiency of substituting soyabean meal with *Moringa stenopetala* leaf on egg production.

Fig. 1. Three-year old *Moringa stenopetala* tree

Fig. 2. Grounded *Moringa stenopetala* leaf (green) with some of other feed ingredients used to formulate the diet

Materials and Methods

- *Moringa stenopetala* leaf was dried under shade, grounded and mixed (Fig. 2 & 3).
- A diet was formulated to contain *Moringa stenopetala* leaf meal at a rate of 0, 3, 8 and 13% by replacing the soybean meal.
- Forty Lohmann-tradition layer hens were randomly distributed to each diet replicated four times with ten hens each.
- Hens were provided with measured amount of feed divided into two portions and fed twice a day in the morning and afternoon.
- Data were collected on egg number, egg weight and feed intake on daily basis from 20 to 28 weeks of hen's age.
- Hen-housed egg production, egg mass and feed conversion ratio were computed.

Results

Table 1. Substitution of soybean meal with *M. stenopetala* leaf meal on feed intake, egg weight and egg mass production

Performance parameters	Levels of Moringa leaf substitution (%)				
	0	3	8	13	SEM
Hen-housed egg production (%)	61.0	58.5	63.3	58.3	3.31
Average egg weight (g)	53.5	53.3	54.1	53.5	0.85
Total egg mass output (kg/hen)	1.61	1.53	1.69	1.54	0.08
Total feed intake (kg/hen)	5.41^{b}	5.26^{b}	5.73^{ab}	6.05^{a}	0.11

- Hen-housed egg yield, egg weight and egg mass were numerically higher in hens fed at 8% *M. stenopetala* levels (Table 1).
- Daily egg mass was highest ($p>0.05$) in hens fed at 8% *M. stenopetala* leaf meal by replacing soybean meal (Fig. 4).
- Hens fed diets with 13% *M. stenopetala* leaf meal showed the highest ($p<0.05$) total feed intake (Table 1).

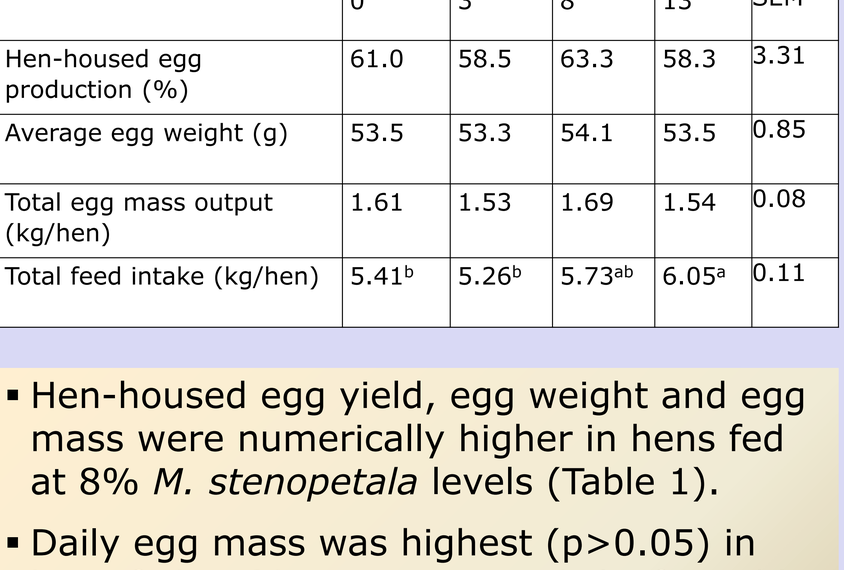

Fig. 4. Effect of substitution of soybean meal with *M. stenopetala* leaf meal on egg weight

Fig. 3. Mixture of grounded *Moringa stenopetala* leaf with other feed ingredients

Conclusions

- Substitution of soybean meal with 8% *M. stenopetala* leaf enhanced hen-housed egg yield, egg weight and egg mass.
- Feed conversion ratio was highest at 13% substitution level suggesting low efficiency of nutrient utilization.
- Replacement of soybean meal with 8% *M. stenopetala* leaf meal appeared to be the optimal level for this study.

Results

- Hens fed diets with 13% *M. stenopetala* leaf meal had the highest ($p<0.05$) daily feed intake (Fig. 5).

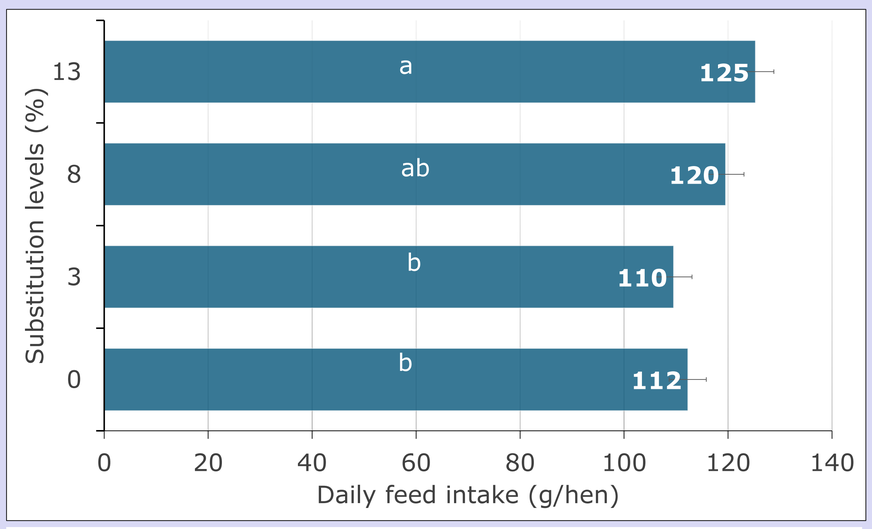

Fig. 5. Daily feed consumption as influenced by *M. stenopetala* leaf meal as a substitute of soybean meal

- The highest feed conversion ratio was observed at 13% substitution of soybean meal with *M. stenopetala* leaf; but it was similar among 0, 3 and 8% levels (Fig. 6)

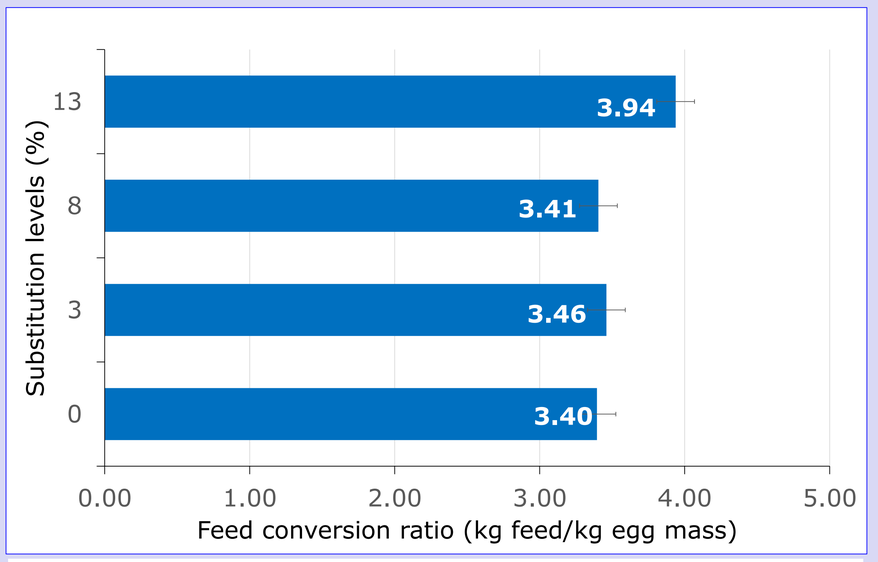

Fig. 6. Effect of *M. stenopetala* leaf meal on feed conversion ratio as a substitute of soybean meal

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