Effects of Marula (Sclerocarya birrea) oil cake as a partial replacement of soyabean meal on the production performance and egg quality of laying hens

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Introduction

- Poultry production in Namibia faces challenges of protein source for chicken feeds.
- Soybean meal (SBM) is a high-quality protein source (Kim, 2014; Taliercio et al., 2014).
- SBM is expensive and locally unavailable in Namibia, it is mostly imported from Zambia and Zimbabwe.
- It is imperative to explore alternative and inexpensive protein sources.
- Marula oil cake (MOC), a byproduct of marula oil extraction is a potential source of protein (Mthiyane et al., 2018).
- Several studies have investigated the effects of replacing SBM with MOC on broiler chickens, however, there are limited studies on laying hens.

Objective

To determine the effects of partial replacement of SBM with MOC in laying hen diets on the production performance and egg quality of Silver Highline Hens

Materials and Methods

- Sixty (60) point-of-lay Hyline Silver chickens used in the experiment
- Birds were randomly assigned to three groups; T1: control (0% MOC), T2: diets with 10% MOC and T3: diets with 15% MOC and fed for 7 weeks, with 5 birds/cage.
- Diets were formulated to be isonitrogenous and isocaloric.
- Egg production were recorded daily and egg quality was assed weekly
- Feed intake and body weight were measured weekly.
- Data were analysed using SPSS (version 28, 2021).

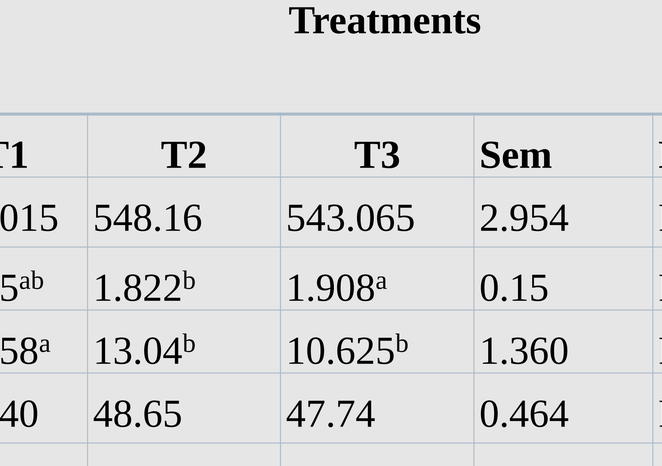
Results & Discussion

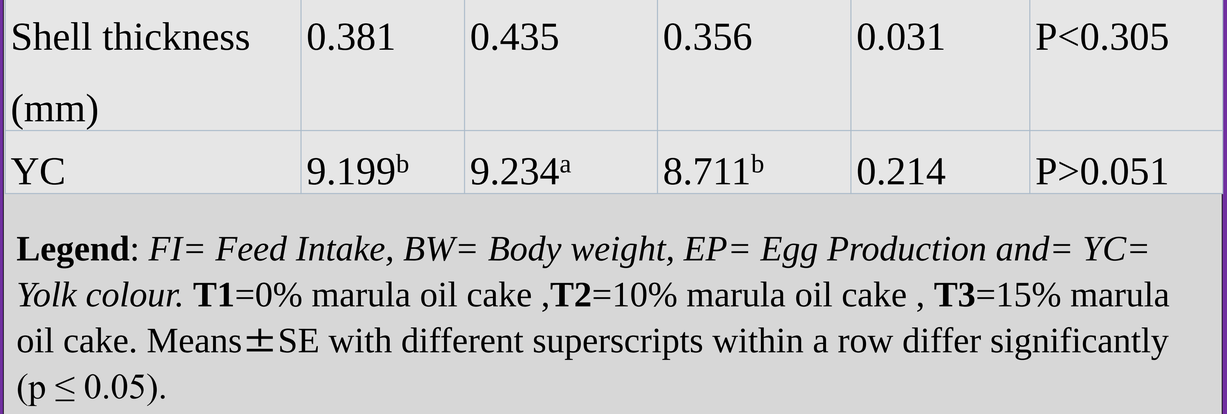
- Our results showed MOC to have a high content of CP (36.7%) and EE (33.2%), comparable to other studies (Mthiyane et al., 2018).
- Replacing SBM with MOC had no effect on feed intake, contrary to previous studies (Mthiyane et al., 2018; Mthana et al., 2023).
- Replacing SBM with MOC had no effect on egg weight and shell thickness (Table 1).
- However, the inclusion of MOC decreased egg production, possibly due to the concentration of oil in the MOC as a result of the oil extraction method used.
- The 10% inclusion of MOC significantly increased yolk colour. The yolk color yolk depends to a large extent on carotenoids contained in plant seeds, which are responsible for the yellow or red colour.
- Birds fed 15% inclusion level of MOC were heavier compared to birds fed 10% MOC, but they did not differ from the control group. This implies that the inclusion at a level 15% of MOC in layer diets had a greater beneficial influence on the body weight.
- Promila (2016) reported an increase in body weight in layers fed at 4% linseed oil.

Table 1: The effects of dietary treatment on the feed intake, body weight and egg production and quality.

Performance Parameter	Treatments				
	T1	**T2**	**T3**	**Sem**	**P- value**
FI (grams)	547.015	548.16	543.065	2.954	P<0.447
BW (Kg)	1.865^{ab}	1.822^{b}	1.908^{a}	0.15	P>0.003
EP	19.958^{a}	13.04^{b}	10.625^{b}	1.360	P>0.001
Egg weight (g)	49.040	48.65	47.74	0.464	P<0.366
Shell thickness (mm)	0.381	0.435	0.356	0.031	P<0.305
YC	9.199^{b}	9.234^{a}	8.711^{b}	0.214	P>0.051

Legend: *FI= Feed Intake, BW= Body weight, EP= Egg Production and= YC= Yolk colour.* **T1**=0% marula oil cake ,**T2**=10% marula oil cake , **T3**=15% marula oil cake. Means±SE with different superscripts within a row differ significantly ($p \leq 0.05$).





Conclusion

- The MOC can partially replace soyabean meal in layer diets without adverse effects on intake, body weight, egg weight and shell thickness, however, it reduces egg production.
- The replacement of SBM with MOC in laying hens needs to be further studied for the maximum utilization of locally available protein sources in poultry diets.

Acknowledgments

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