



Replacement of soybean meal with *Moringa stenopetala* leaf meal enhances the organoleptic properties of internal egg qualities in Lohmann-traditional chicken breed

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Introduction

- Poultry farming is eco-friendly with little impact on environment.
- Poultry meat and eggs are good sources of high-quality protein.
- Egg quality and sensory attributes might differ depending on feed type and its compositions.
- Moringa stenopetala* is a multi-purpose tree endemic to southern Ethiopia and Northern Kenya.
- Due to its bioactive compounds, *M. stenopetala* leaves could improve sensory properties of internal egg qualities.
- Research objective:** evaluate effect of *M. stenopetala* leaf meal on organoleptic properties of internal egg qualities.

Results

Table 1. Substitution of soybean meal with *M. stenopetala* leaf meal on organoleptic properties of internal egg qualities

Sensory attributes	Substitution levels(%)				SEM	P-value
	0	3	8	13		
Yolk	2.33 ^c	3.83 ^b	4.44 ^a	4.94 ^a	0.159	0.008
Albumen	3.56 ^b	4.22 ^a	4.50 ^a	4.52 ^a	0.182	<0.001
Aroma	3.55 ^b	3.94 ^{ab}	4.17 ^a	4.33 ^a	0.147	<0.001
Texture	3.33 ^b	4.05 ^a	4.02 ^a	4.06 ^a	0.192	0.025
Flavour	3.67 ^c	4.22 ^b	4.17 ^b	4.72 ^a	0.149	<0.001
Acceptability	3.12 ^c	3.89 ^b	3.99 ^b	4.33 ^a	0.092	<0.001

- Hens fed *M. stenopetala* leaf showed most desirable aroma and flavour than from those fed control diet (Table 1).
- Best yolk color was obtained from hens fed on 8 and 13% *M. stenopetala* diets (Fig. 3).
- Overall acceptability was higher for hens fed 13% *M. stenopetala* leaf than those of 3%, 8% and control diets.
- Aroma of evaluated eggs enhanced with increased substitution levels (Fig. 4).

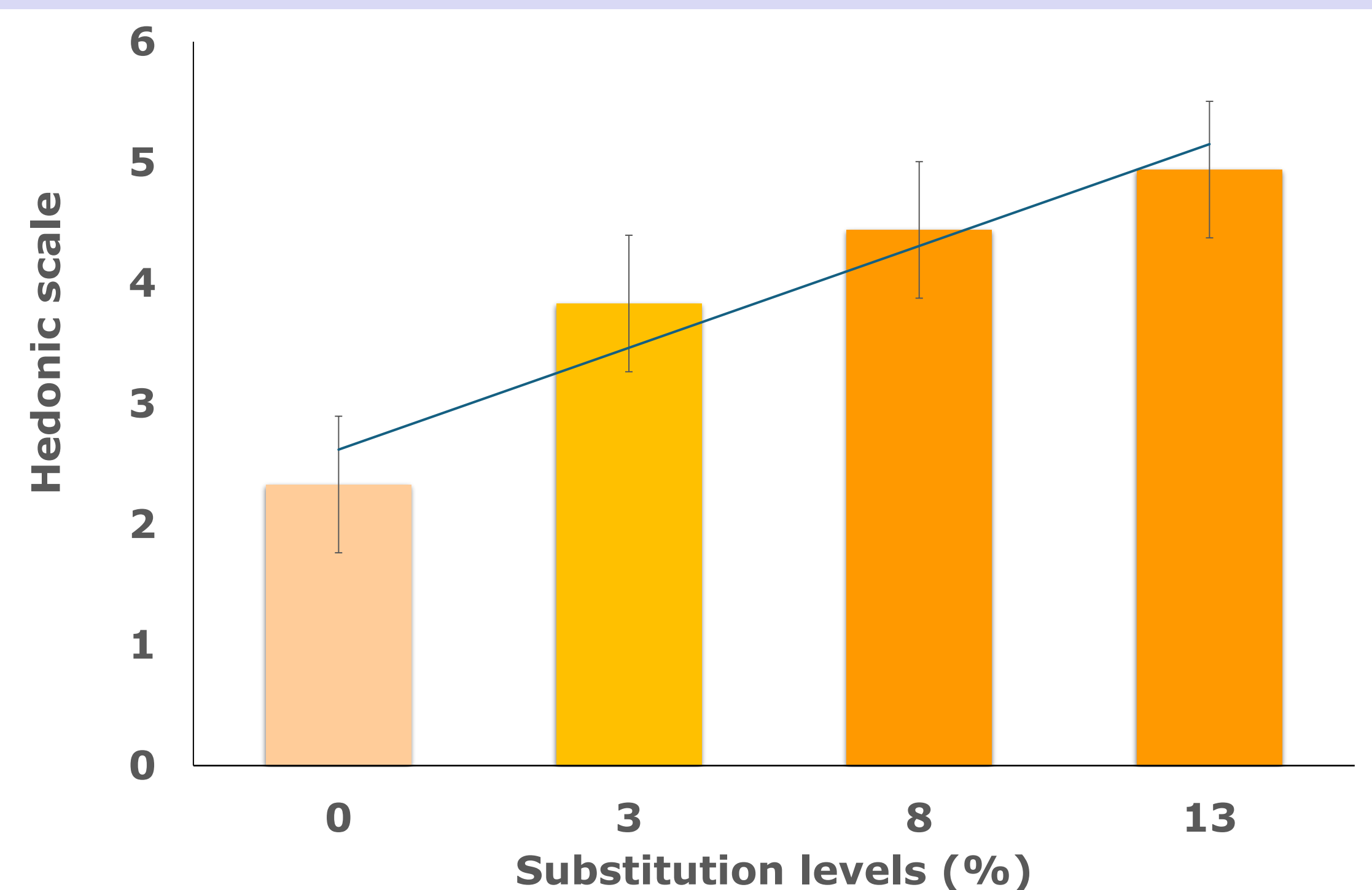


Fig. 3. Substitution effect of soybean meal with *M. stenopetala* leaf on organoleptic profile of **egg yolk colour**



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



Fig. 2. Drying *Moringa stenopetala* leaf under shade

Flavour of eggs consistently enhanced with increased substitution levels of *M. stenopetala* leaf (Fig. 5).

Conclusions

- Substitution of soybean meal with 8 and 13% *M. stenopetala* leaf enhanced egg yolk colour, aroma and flavour.
- Replacement of soybean meal with *M. stenopetala* leaf appeared to be beneficial for improved sensory profiles.
- Further research on presence of bioactive compounds and their connection to organoleptic profiles is recommended.

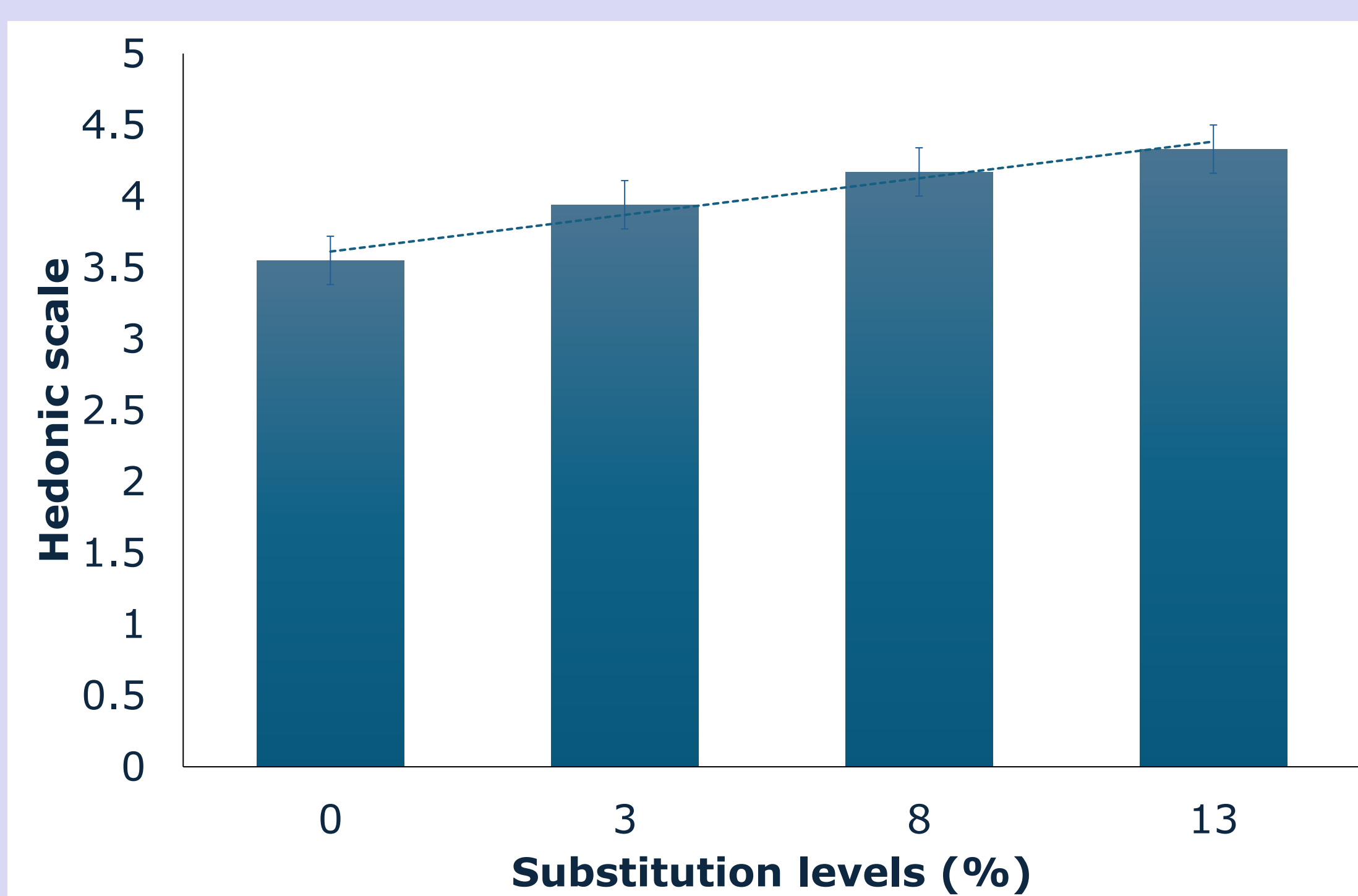


Fig. 4. Substitution effect of *M. stenopetala* leaf on the **aroma** of the egg content

Materials and Methods

- M. stenopetala* leaf dried under shade, grounded and mixed.
- Diets were formulated to contain *M. stenopetala* leaf meal at a rate of 0, 3, 8 and 13% by replacing the soybean meal.
- Forty hens were randomly distributed to each diet replicated four times with ten hens each.
- Four organoleptic attributes studied: aroma, texture, appearance, and flavour of eggs.
- Evaluation held in two sessions for two consecutive days using 18 panellists.
- Each panellist received 8 hardboiled eggs (2 eggs/treatment) totalling 144 eggs.
- Each panellist assessed each egg using a five-point hedonic scale: 5 (like very much), 4 (like much), 3 (neither like nor dislike), 2 (dislike much), 1 (dislike very much).

Results

- Hens fed with 3 and 13% *M. stenopetala* produced higher desirable aroma than those of control group (Fig. 4).

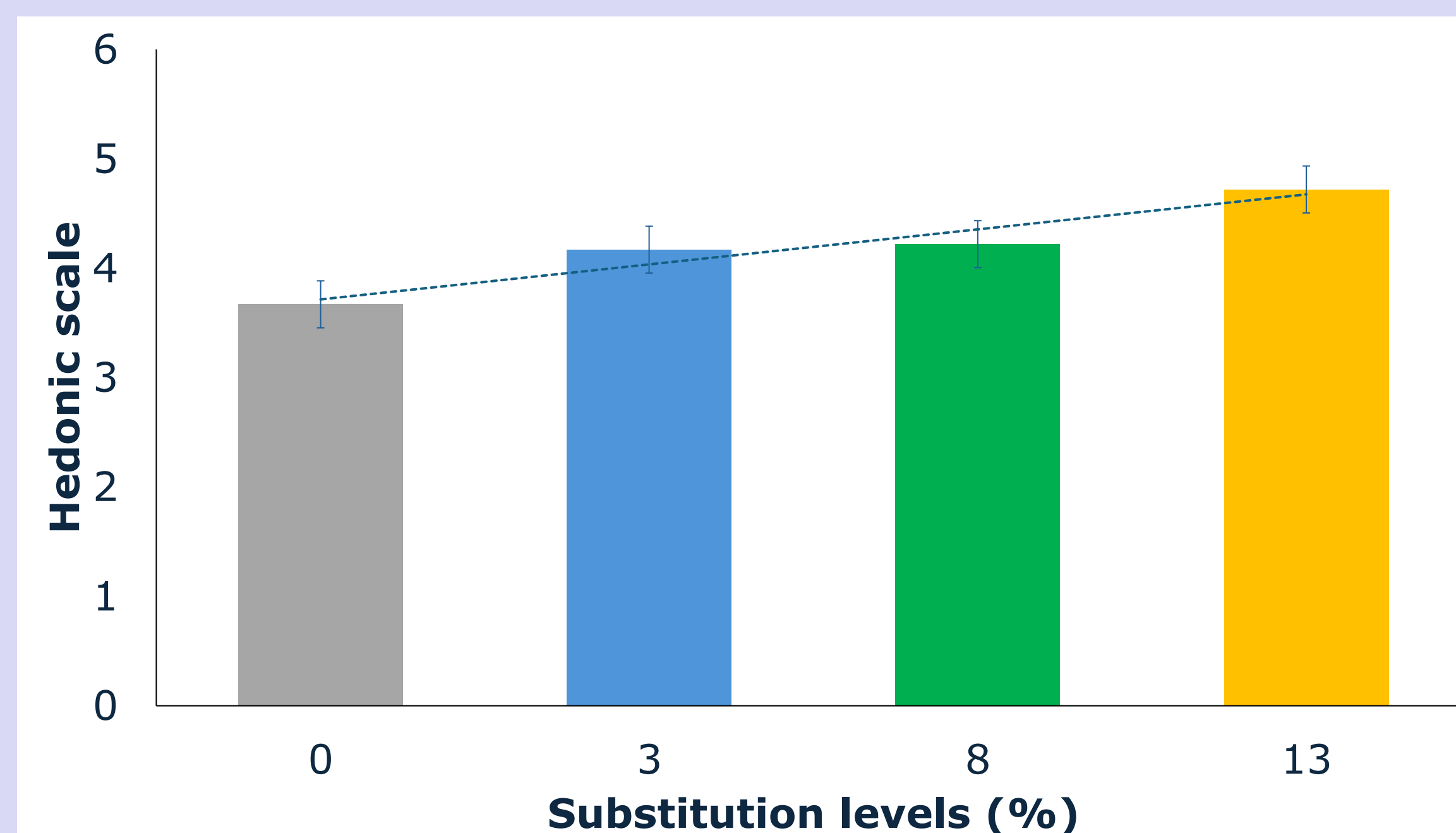


Fig. 5. Substitution effect of *M. stenopetala* leaf on the **flavour** of egg content

- Albumen appearance was highest for eggs produced by hens fed with 13% *M. stenopetala* compared to control (Table 1).
- Appearance of albumen improved with increased substitution levels of *M. stenopetala* (Fig. 6)

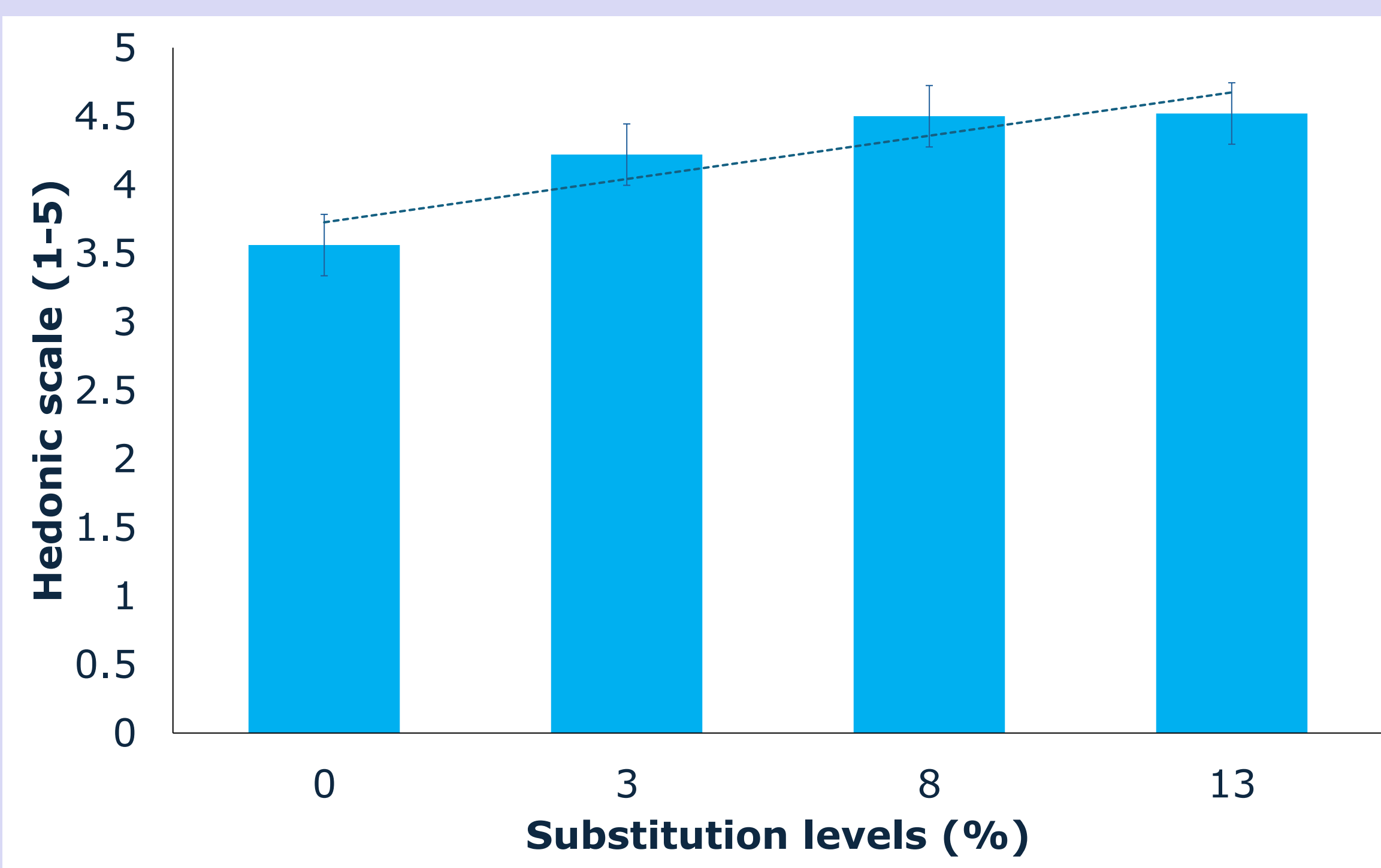


Fig. 6. Replacement effect of soybean meal with *M. stenopetala* leaf on **albumen appearance**