



Responses of Pita pinta laying hens fed live black soldier fly (*Hermetia illucens*) larvae in Northern Spain

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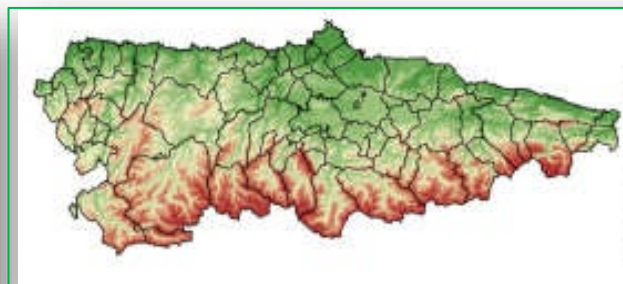
Food production based on local natural resources to reduce ecological footprint: local feed for local livestock breeds



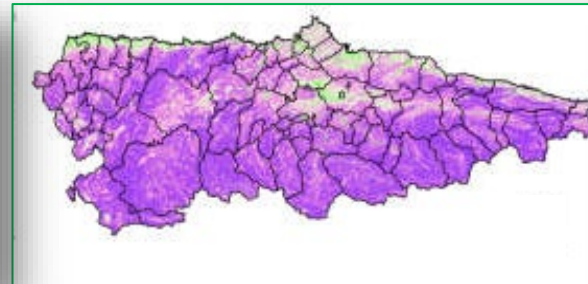
Asturias environmental and socioeconomic characteristics:



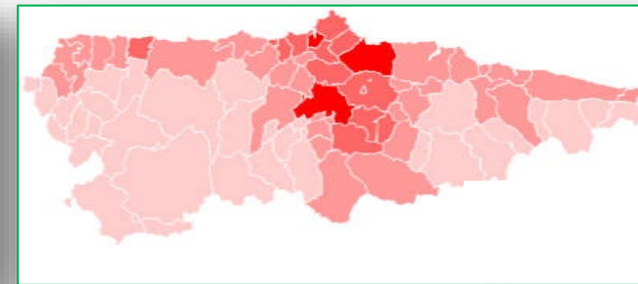
960 mm/year



Altitudes above 400 m a.s.l.



80% surface slopes above 20%

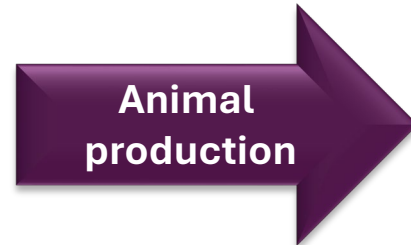


Population concentrated in cities

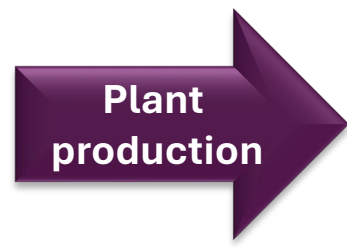
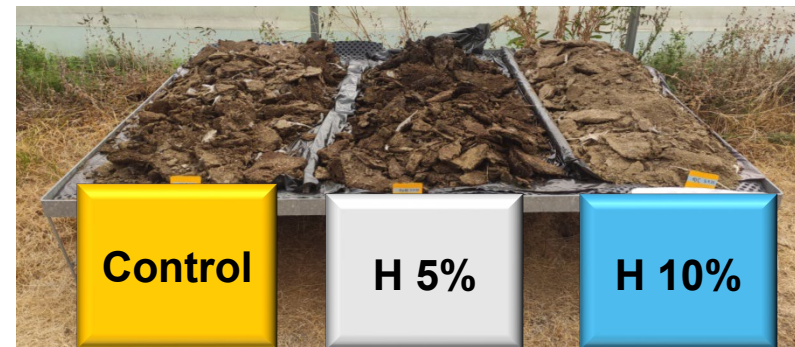
LIMITED PRODUCTIVE OPTIONS TO MOST FAVORABLE AREAS

Aim:

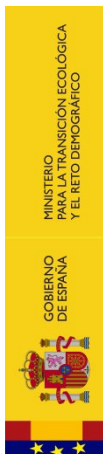
Assess animal production, health & welfare and product quality of traditional breed (Pita pinta)



Production
Health
Welfare
Quality



Soil health - WP4 - Biofertilizers



Traditional breed

Dual purpose

Liveweight: 2.25 kg/♀; 3.75kg ♂

Maturity age: 7 months

Eggs: 160 eggs/year; 65 g

Carcass weight: 3kg



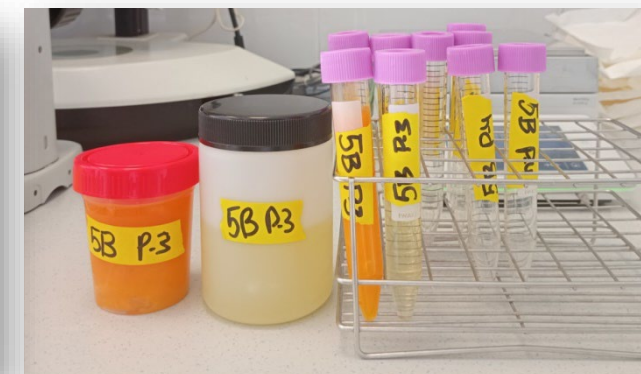
TREATMENTS

Ingredients	Control	H 5%	H10%
CORE DIET 	90 	90 	90 
FEED MIX 	10 	5 	-
LIVE LARVAE 	-	5 	10 

- Period: 12 weeks 10 animals/treatment T0, T1 and T2
- N° eggs, n° defected eggs, n° individuals
- Blood samples (n=6/treatment)
- Faecal samples, (n=4/treatment)
- Life weight, Plumage status
- Video recording

T0 = 60 eggs 4 replicates/treatment (3 treatments) 5 eggs/replicate

T1 & T2= 180 eggs/period 4 replicates/plot (nine plots, 3 plots/treatment) 5 eggs/replicate



- Egg weight
- % edible portion: $[(\text{egg weight} - \text{shell weight}) / \text{egg weight}] * 100$
- Shape index: $(\text{equatorial diameter} / \text{egg height}) * 100$
- Albumen/yolk ratio

- Haugh unit , Yolk index,
- colour (fresh and boiled yolk)

- Chemical analyses:

Proximate composition (DM, CP, EE, Ash); FA profile; Lipid oxidation products [TBARS]; 5) heavy metals

- Egg shell:
- Weight and thickness
- Shell % : $(\text{shell weight} / \text{egg weight}) * 100$;
- Colour



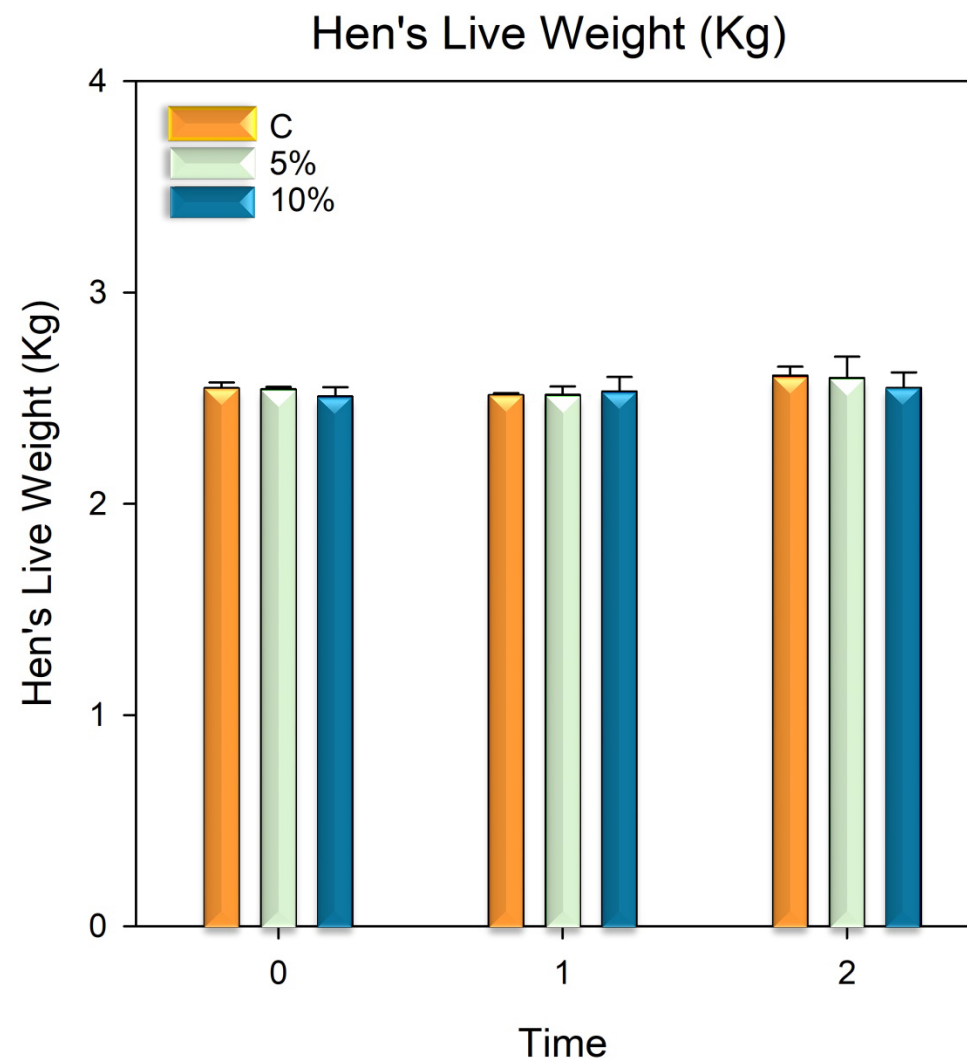
Eggs less than 30 days old



3.1. Hen's live weight

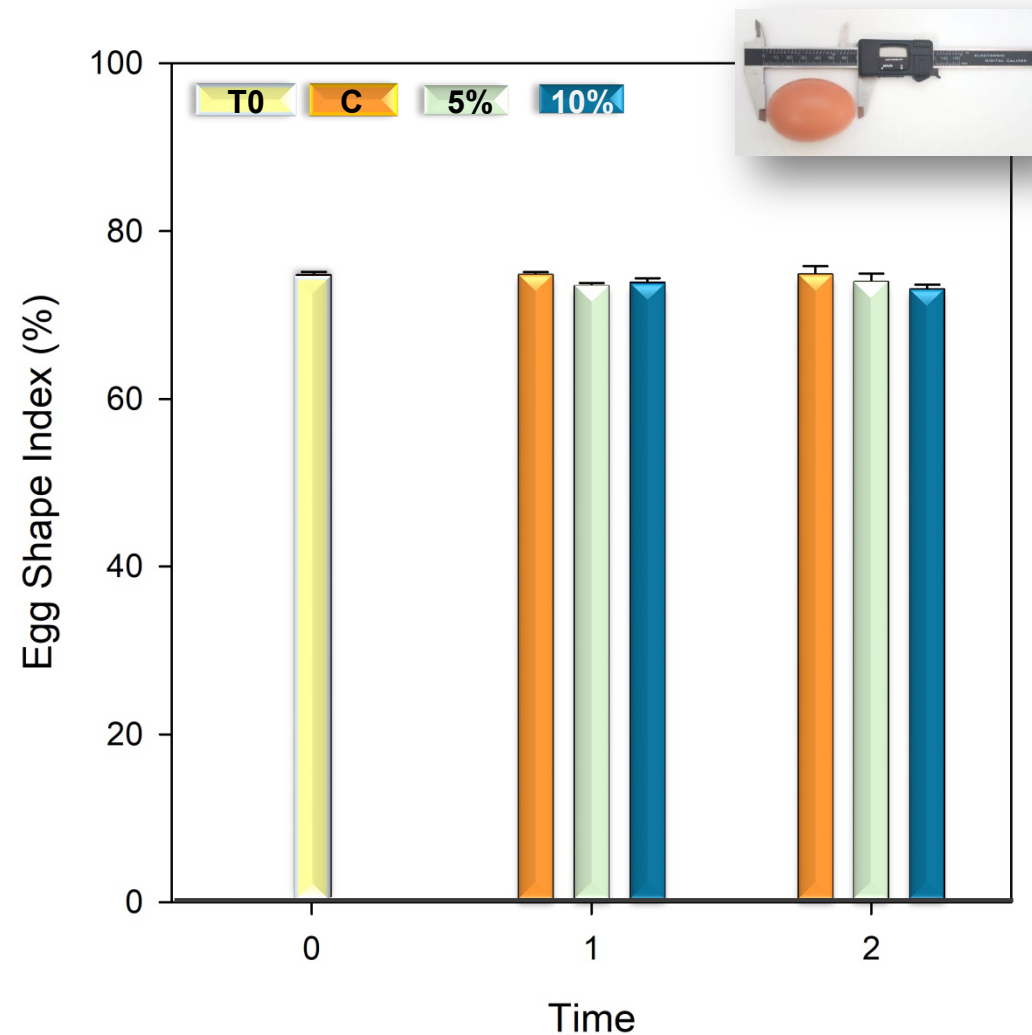
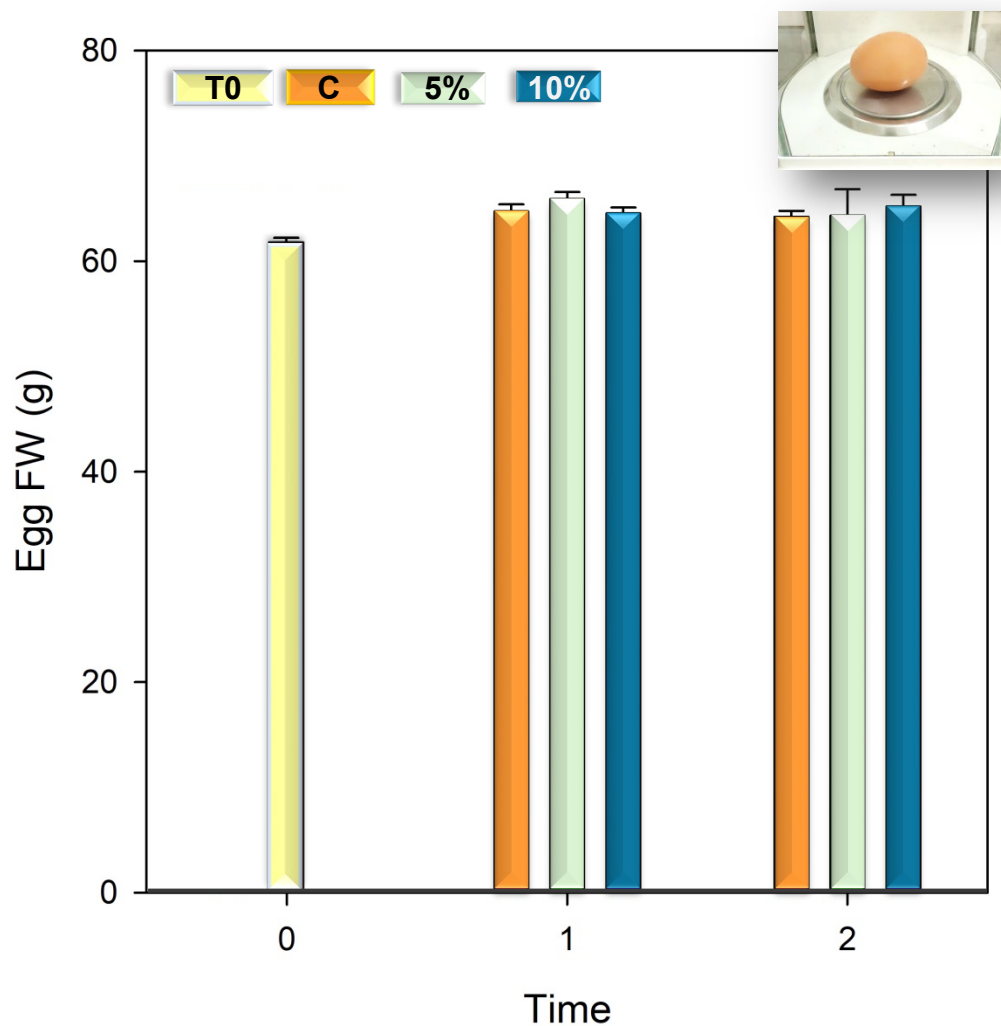


No significant differences
Between periods/treatments



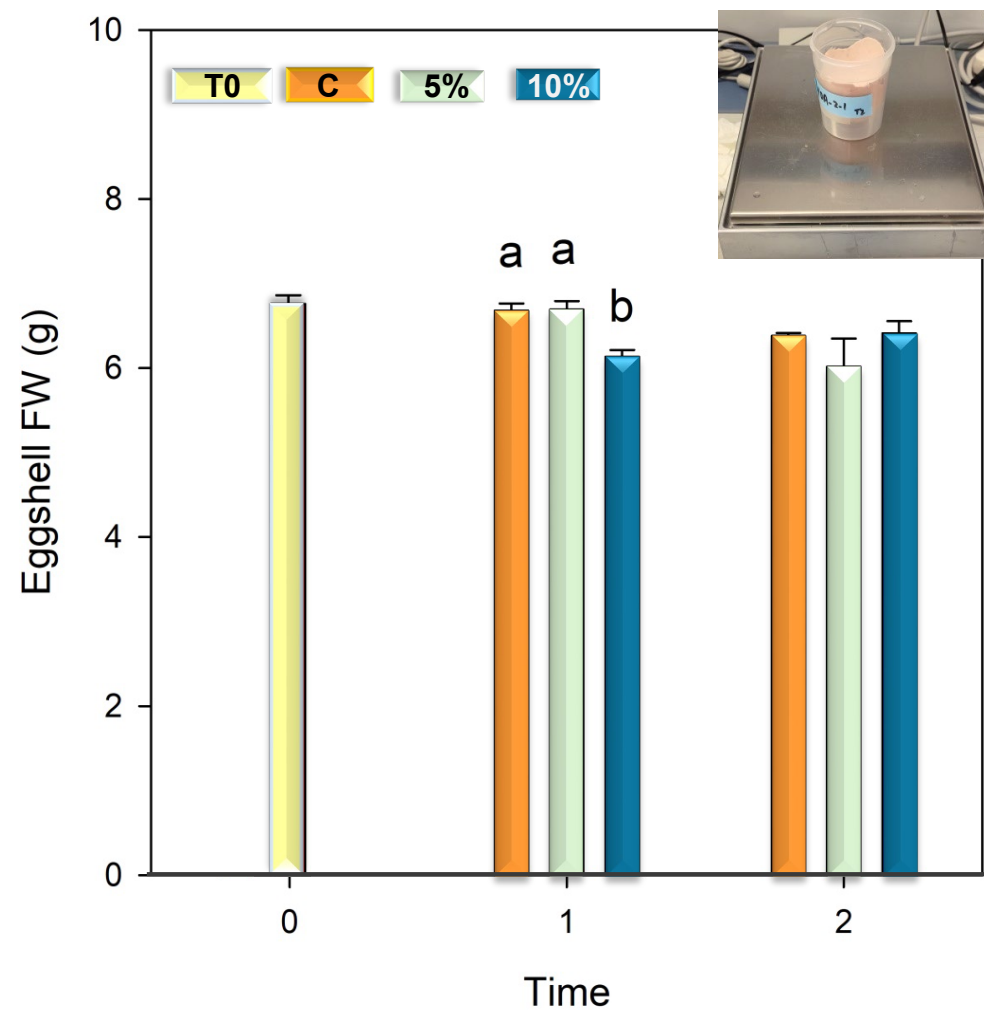
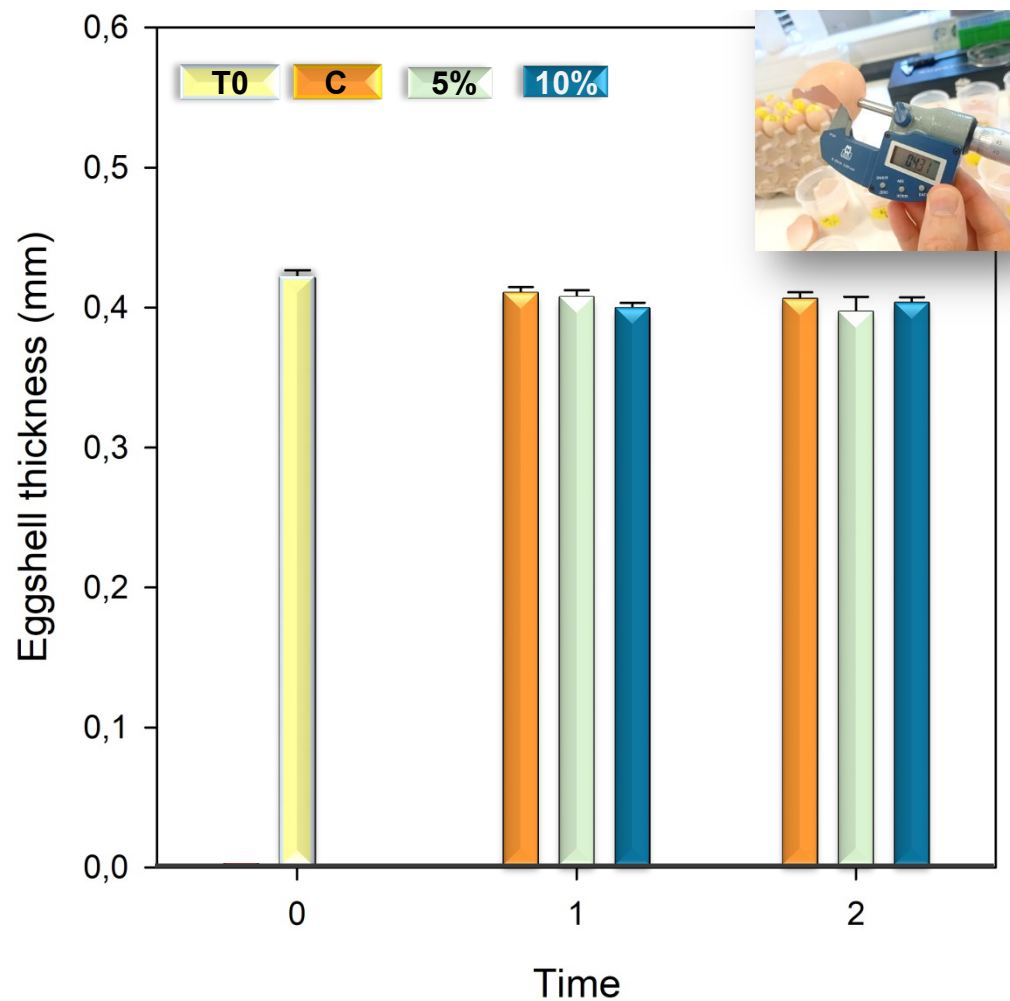


3.2. Egg weight and shape

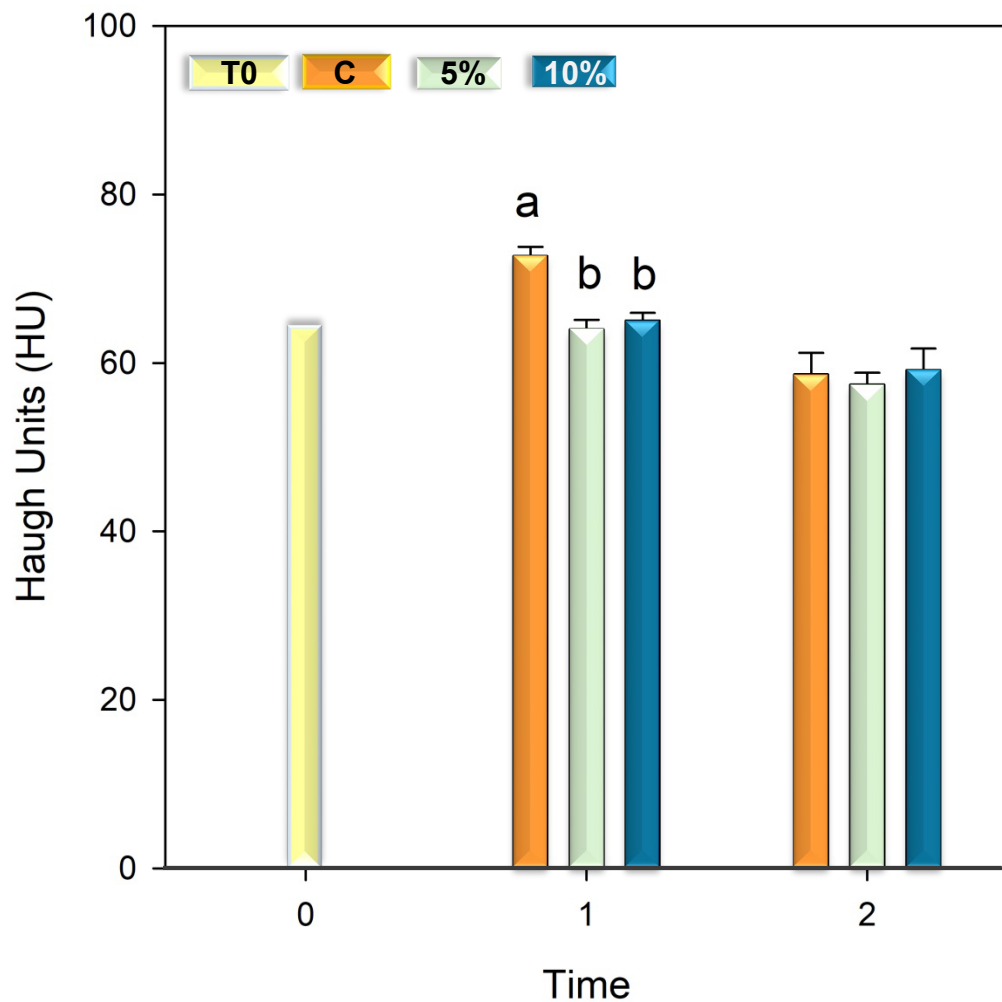


No significant differences

3.2. Thickness and weight

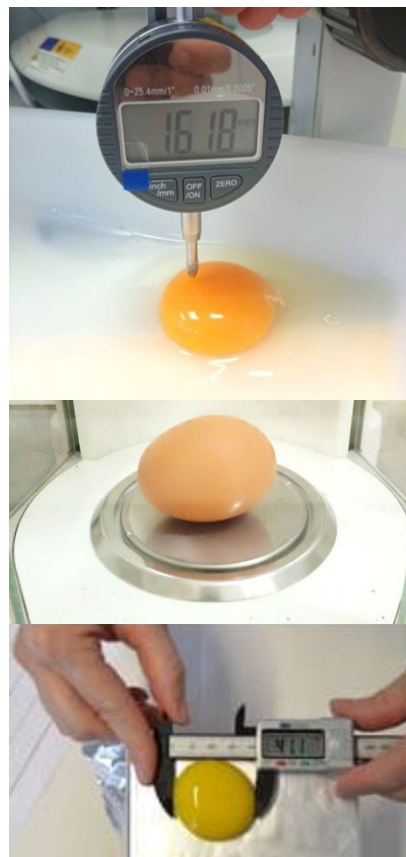


3.3. Egg quality



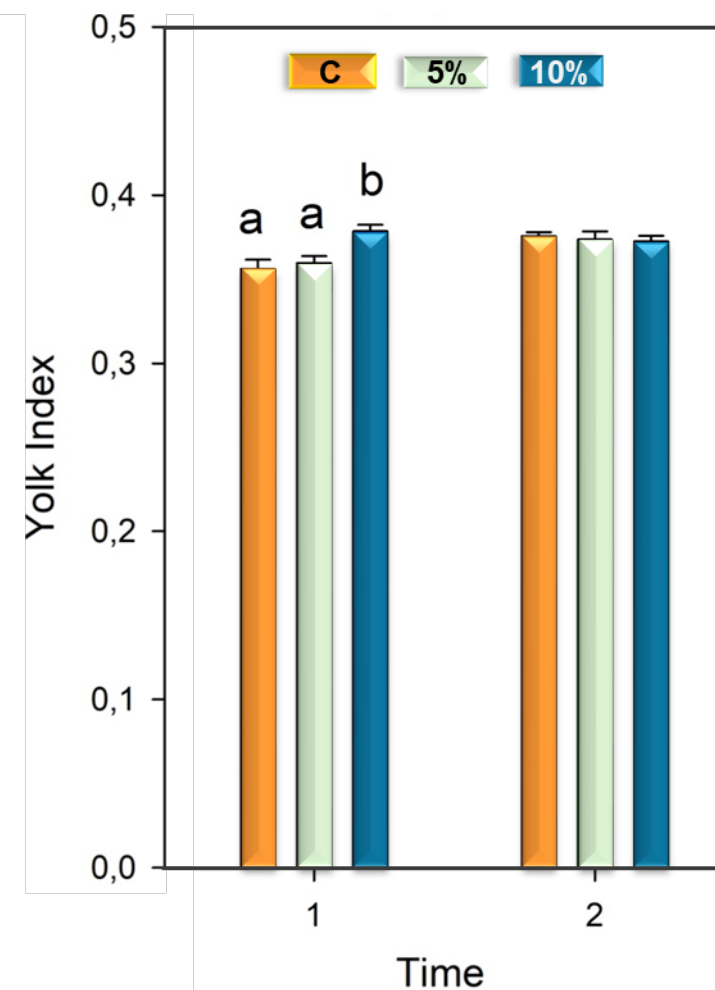
$$HU = 100 \times \log (AH - 1.7W^{0.37} + 7.6)$$

AH= albumen height, W=Egg fresh weight



HU: **C** highest T1

YI: **10%** highest T1



$$YI = YH / YD$$

Y index=Yolk height/Yolk width



CONCLUSIONS

1. Feed treatments did not affect hen's live weight.
2. Egg physical parameters and egg quality changed along time, being similar between treatments at the end of the experiment.
3. The use of *Hermetia illucens* larvae to feed Pita pinta hens provided similar productive responses than commercial feed strategies.





Thanks for your attention!

