

Poultrynsect

Levende insecten als voer voor pluimvee

Mini Symposium bio-onderzoek

24/06/2024

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Waarom levende larven voederen aan pluimvee?

Een natuurlijke voedingsbron voor pluimvee

→ Stimuleren van foerageer gedrag → Verrijking

Veldkamp & Niekerk, 2019 bij kalkoen:

Provision of BSFL **reduced aggressive pecking** directed at the back and tail base at 5 weeks of age. Although the incidence of feather and skin damage was low, this type of damage tended to be lower in the BSFL groups.

Ipema et al., 2020 bij vleeskuikens:

long-term **elevated levels of foraging behaviour** and general activity in broilers receiving BSFL, and this effect was largest and most consistent for broilers receiving BSFL in the highest amount and frequency tested, i.e. 10 % of their dietary DM as larvae provided four times a day. Broilers receiving 5 % or 10 % of their dietary DM as BSFL four times a day **also experienced improved leg health**.

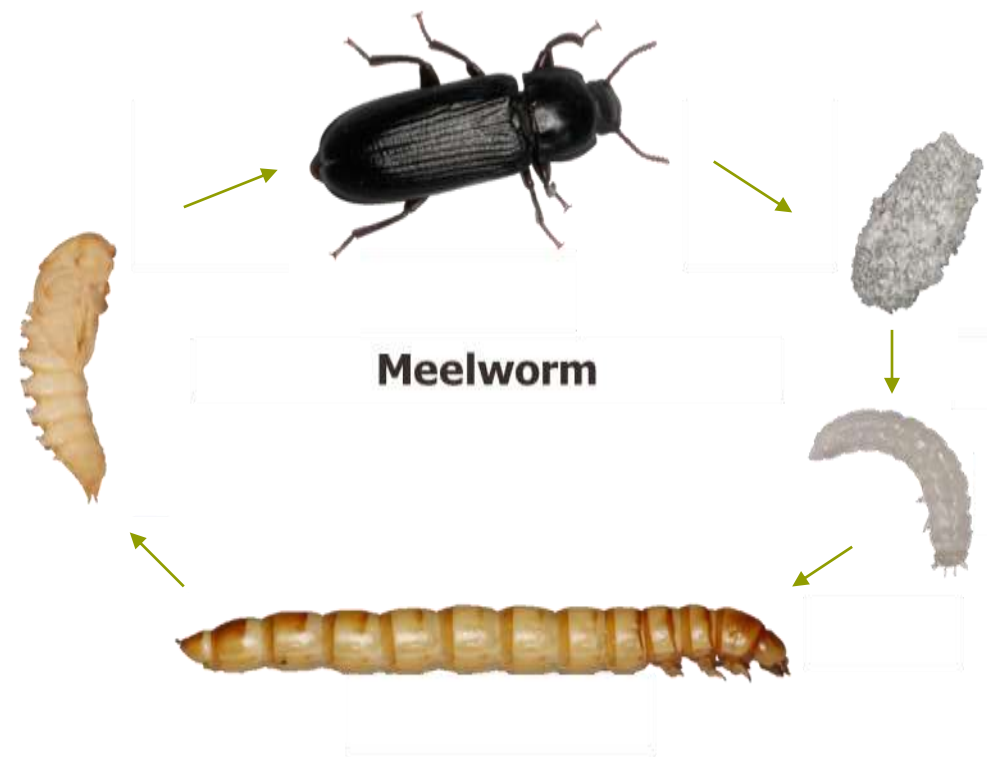
Welke insecten zijn er?

Bijna 1 miljoen soorten, tiental commercieel als eiwitbron

Levenscyclus van **1 maand**

1000 nakomelingen/vrouwtje/week

Brijvoeder (op reststroombasis)



Levenscyclus van **3 maanden**

100 nakomelingen/vrouwtje/week











Droog voeder (op graanbasis)

+ vochtbron



Wat mag er in de EU?

Levende larven mogen
Maar er zijn nog geen
bio insecten

							
Insects as feed - Regulation (EU) No 608/2013 on the Catalogue of feed materials and in accordance with Regulation (EC) No 999/2001 and Regulation (EC) No 1069/2009	Ruminant animals 	Aquaculture 	Poultry 	Pigs 	Pets 	Fur and other animals (e.g. zoo) 	Technical uses (e.g. cosmetic industry, bio-based fuels, production of other bio-based materials such as bioplastics) 
Processed animal proteins	⊗	✓**	✓**	✓**	✓	✓	✓
Insectenvet	✓	✓	✓	✓	✓	✓	✓
Onverwerkte dode insecten	⊗	⊗	⊗	⊗	✓***	✓***	✓
Verwerkte dode insecten	⊗	⊗	⊗	⊗	✓***	✓***	✓
Levende insecten	⊗	✓*	✓*	✓*	✓***	✓***	✓
Gehydrolyseerd insecteneiwit	✓	✓	✓	✓	✓	✓	✓

*If authorized by the national competent authority of the Member State where the product is being commercialised

** Limited to Black Soldier Fly (*Hermetia illucens*), Common Housefly (*Musca domestica*), Yellow Mealworm (*Tenebrio molitor*), Lesser Mealworm (*Alphitobius diaperinus*), House cricket (*Acheta domestica*), Banded cricket (*Gryllodes sigillatus*), Field Cricket (*Gryllus assimilis*) and Silkworm (*Bombyx mori*).

*** If authorized by the national competent authority of the Member State where the product is being commercialised, under the specific conditions applicable to processed pet food (in case the product is intended for use as processed pet food)

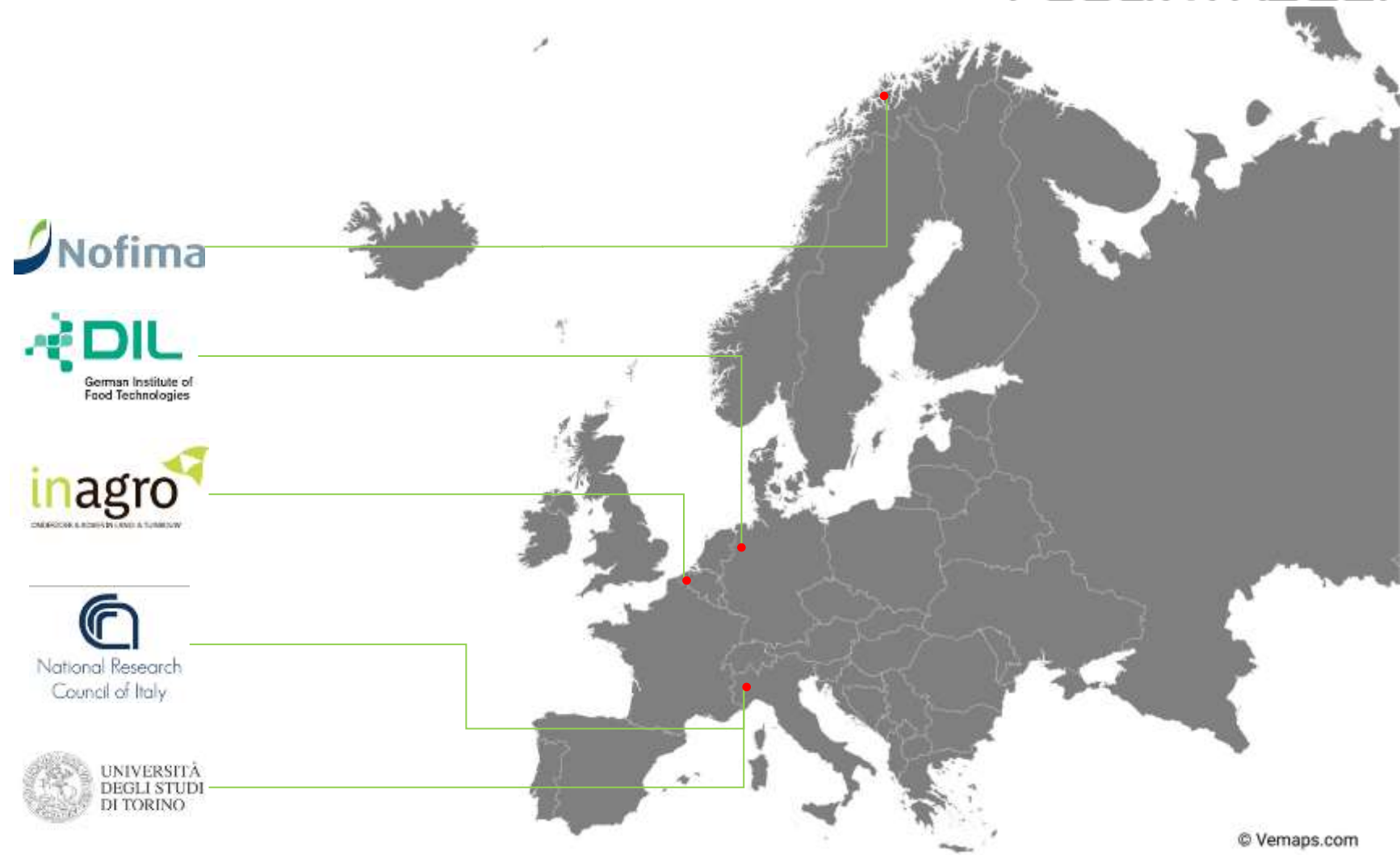
Restriction to insect species (insect PAPs for aqua feed)- Regulation (EU) No 142/2011; Annex X Chapter 2 Section 1, A (2).
- Insect PAPs must be produced in **processing plants approved** in accordance with Article 24(1)(a) of Regulation (EC) No 1069/2009 and **dedicated exclusively** to the production of products derived from farmed insects. Regulation (EC) No 999/2001; annex IV, chapter IV, Section F, 1 (a).
- Insect PAPs must be produced according to **processing methods 1 to 5** or **processing method 7** (Regulation (EU) No 142/2011, Annex X, Chapter II, Section 1, B (2)).

No restriction as to the insect species (provided that these are not pathogenic to humans and animals)

Over Poultrynsect

Start: 01/11/2020

Einde: 31/10/2023



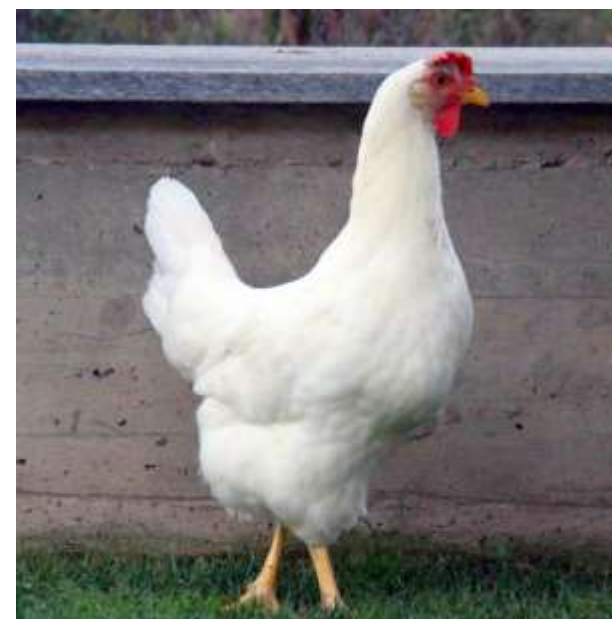
Twée voederproeven

1. Label naked neck

- Start na 28 dagen
- medium groeiend ras
- 82 dagen

2. Bianca di Saluzzo

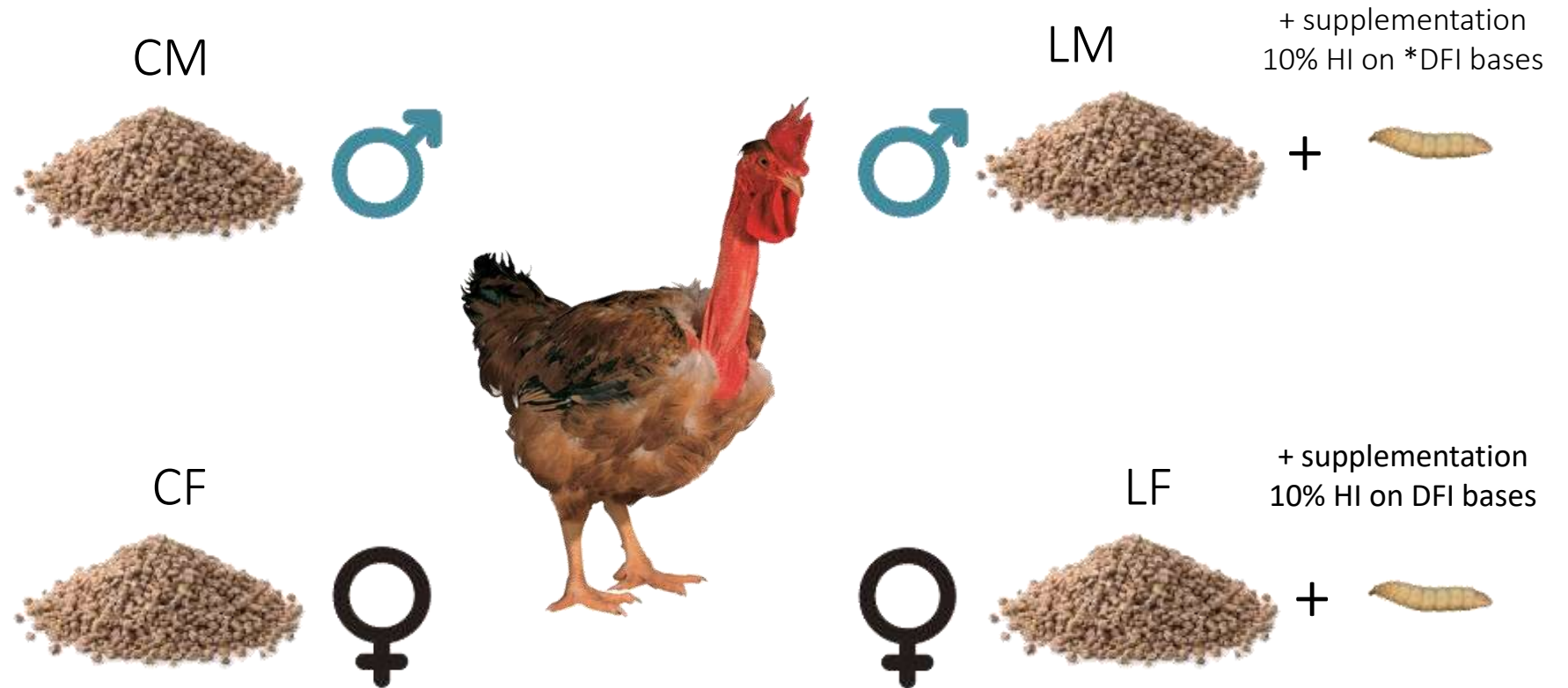
- Start na 39 dagen
- traag groeiend ras
- 150 dagen & 180 dagen



Label naked neck

4 experimentele groepen
10 kippen per pen
6 herhalingen

120 hanen + 120 hennen



CM control male
CF: control female

LM: larvae male
LF: larvae female

*DFI: daily feed intake

Opvolgen van groei en dierenwelzijn



Groei en slachtparameters

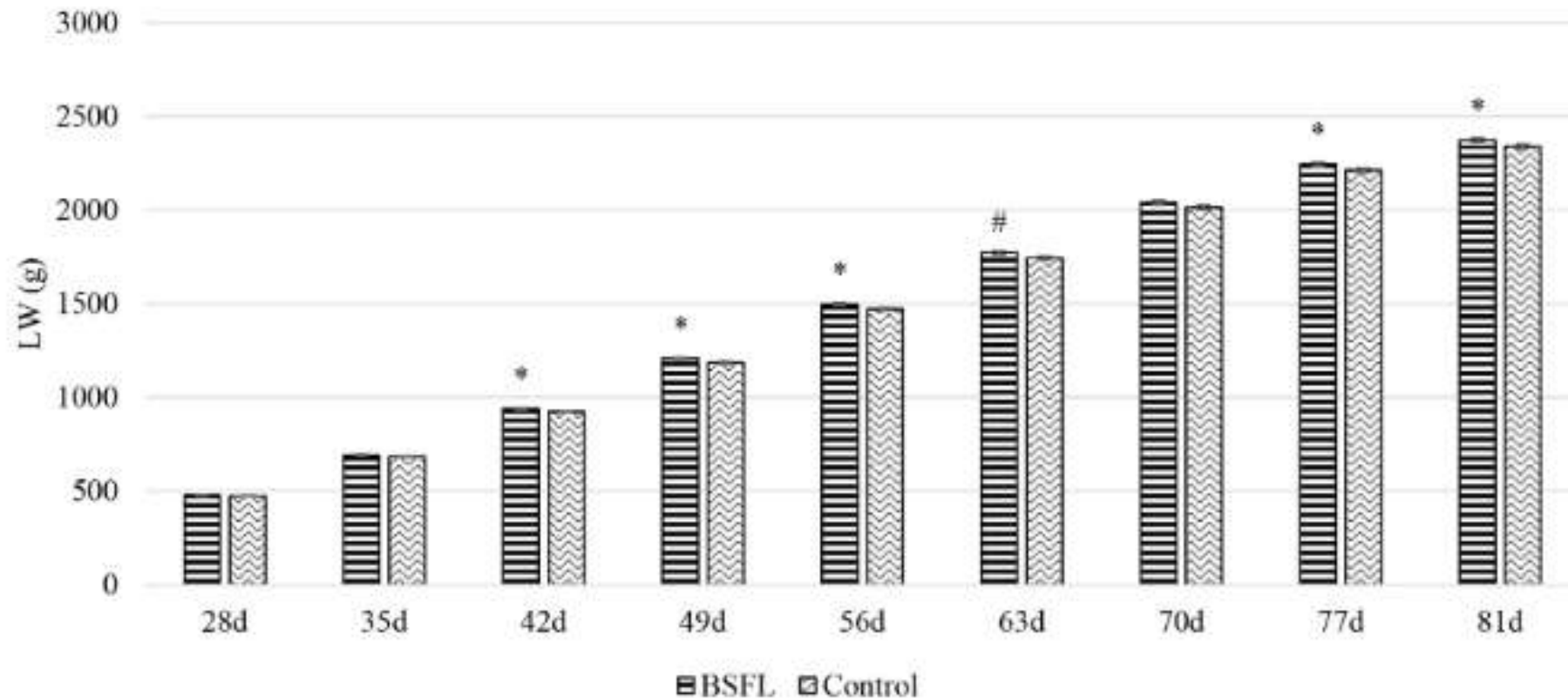


FIGURE 2

The growth curves of the Label Rouge Naked Neck birds fed a diet supplemented with 10% live black soldier fly larvae; supplementation based on the expected daily feed intake, (28–81 d; $n = 6$). # Indicates a statistical trend for the control and BSFL supplemented birds ($P \leq 0.10$); *Indicates a statistical difference between the control and BSFL supplemented birds ($P \leq 0.05$). LW, live weight.

Resultaten

- Significant zwaardere kippen (32 g) op het moment van slachten
- Geen effect op slachtparameters zoals karkas, filet of dijgewicht
- Wel groter hart en significant zwaardere milt

Bongiorno V, Gariglio M, Zambotto V, Cappone EE, Biasato I, Renna M, Forte C, Coudron C, Bergagna S, Gai F and Schiavone A (2022) Black soldier fly larvae used for environmental enrichment purposes: Can they affect the growth, slaughter performance, and blood chemistry of medium-growing chickens? *Front. Vet. Sci.* 9:1064017. doi: 10.3389/fvets.2022.106401



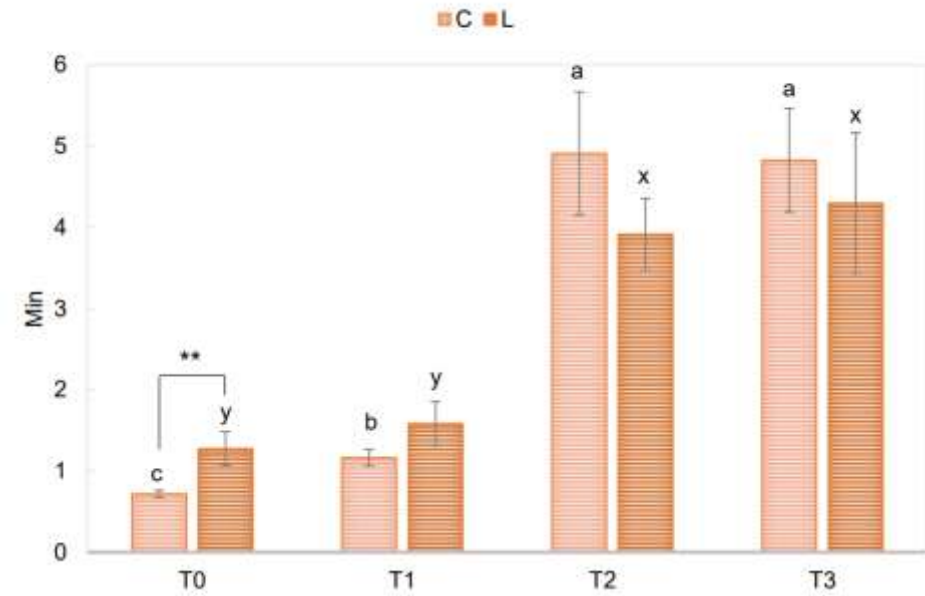
Gedrag en welzijn

- Tonische immobiliteit

- Avoidance distance test

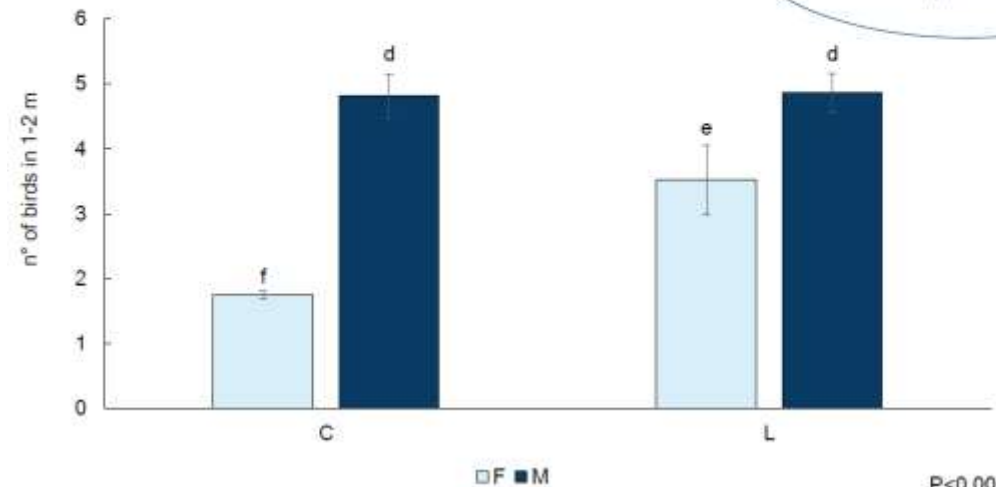
Figure 7 Tonic immobility duration (diet×time)

P<0.05



Avoidance distance test

Sex × diet



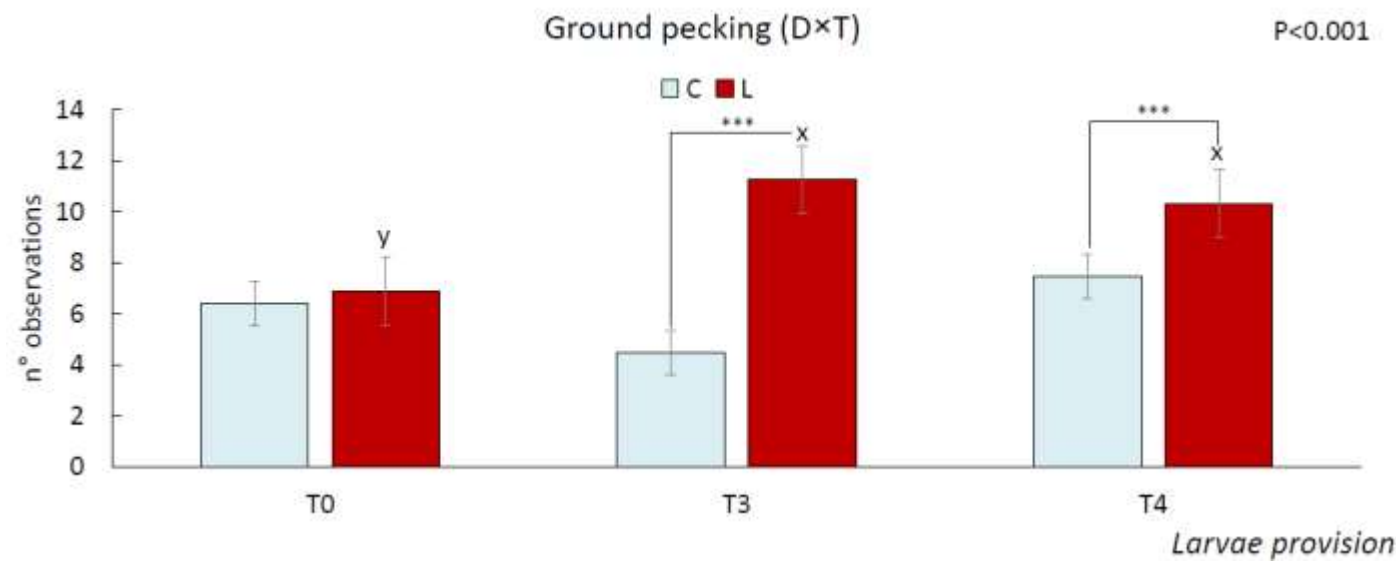
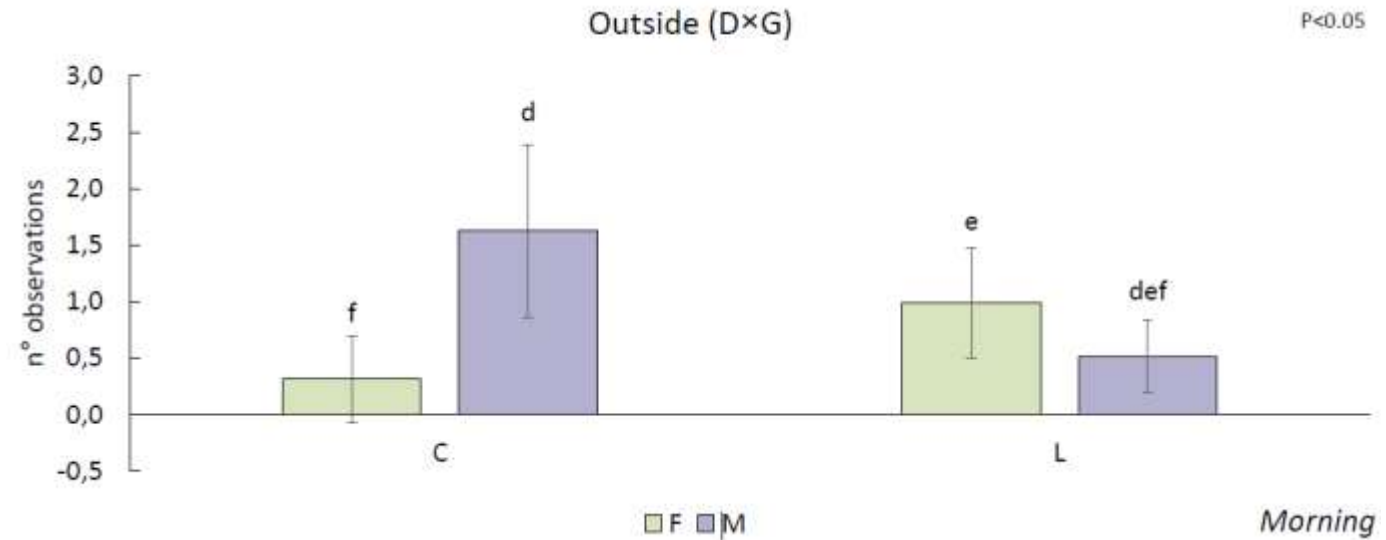
The live larvae increased the number of F come within 1-2m from the operator

P<0.001



Gedrag en welzijn

- Tijd buiten
- Scharrelen



Resultaten

- Geen negatieve gevolgen voor de veren, poten of huidbeschadigingen van de vogels
- Geen significante verschillen voor de tonische immobiliteitsscore of corticosterongehalte van de mest
- Angstreductie, vooral bij hennen
- Toegenomen foerageergedrag
- Hogere heterophile/lymphocyte ratio bij met larven gevoede kippen dan bij controle dieren → stress door competitie of anticiperend gedrag?

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