Do strains affect insect farming efficiency?

The effect of *Tenebrio molitor* strains on adult fecundity and larval growth

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EAAP European Federation of Animal Science

INSECT GENETICS IMP rovement plementation act

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

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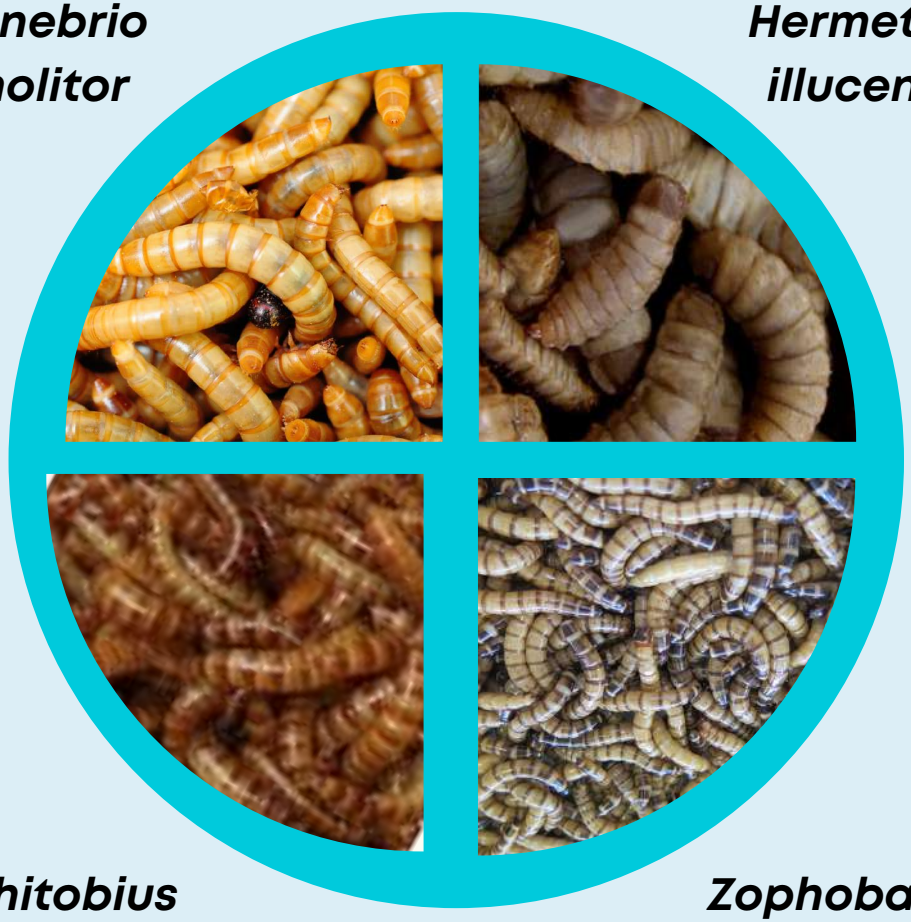
Tenebrio molitor

Hermetia illucens



Alphitobius diaperinus

Zophobas morio

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7 DIFFERENT STRAINS

Tenebrio molitor

WHERE DO THEY COME FROM?

Greece

Germany

Italy

USA

Turkey

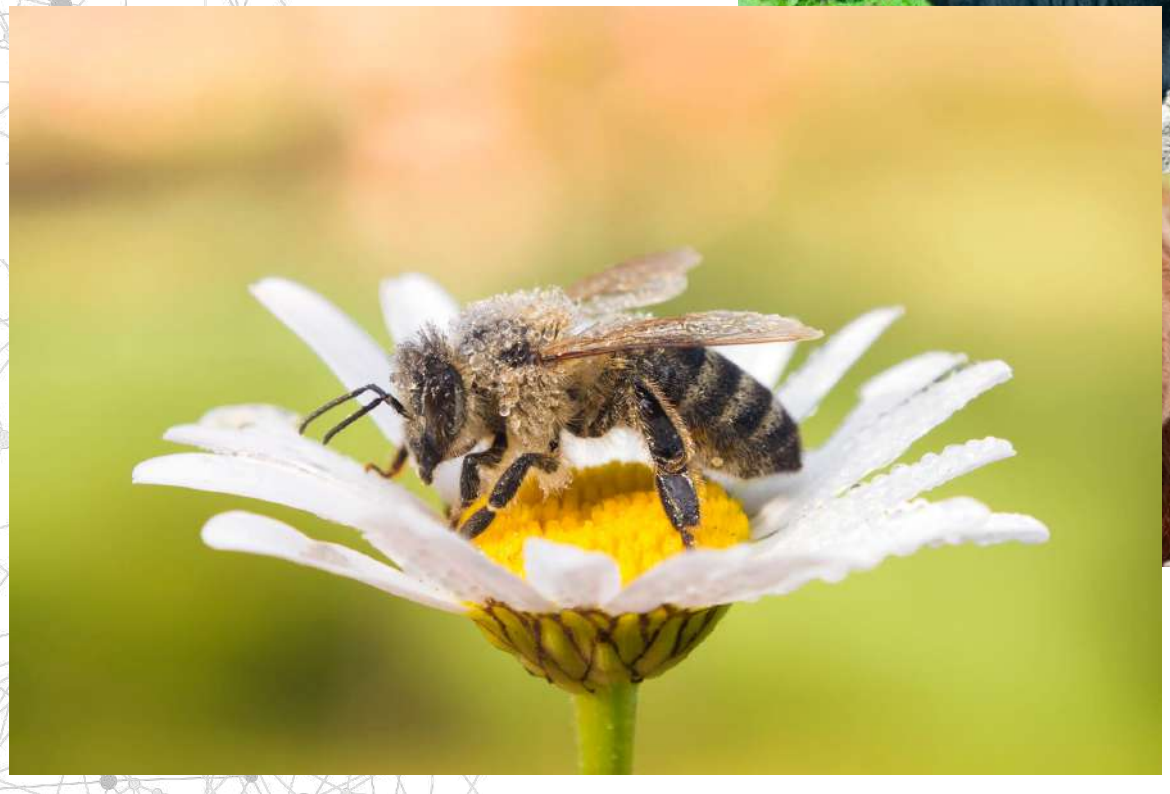
Spain

Intra specific variations

Intra specific variations

Genetic architecture

Intra specific variations



Intra specific variations

Tenebrio molitor L.

OBJECTIVES

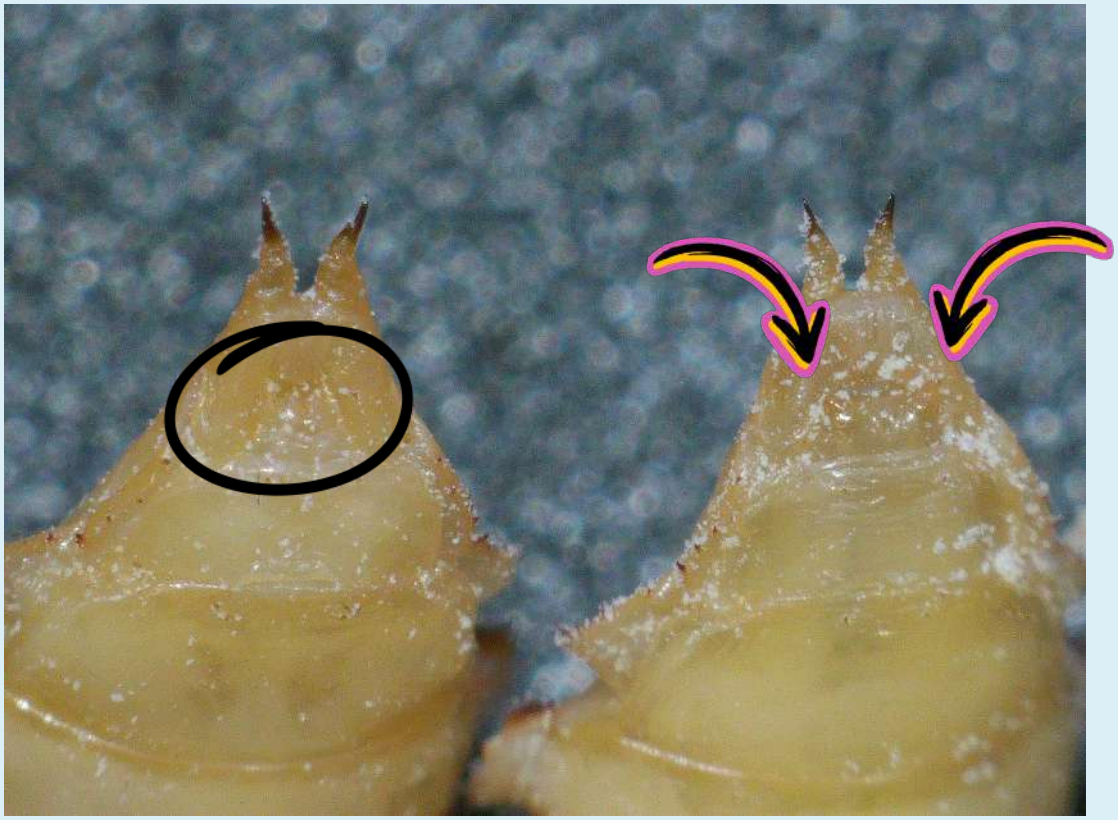
Strain effect on:

1. **The adult performance**
2. **Larval growth**

Strain effect on the adult performance of the yellow mealworm, *Tenebrio molitor* L.

SEXING OF PUPAE

MALE **FEMALE**



Strain effect on the adult performance of the yellow mealworm, *Tenebrio molitor* L.

6 strains

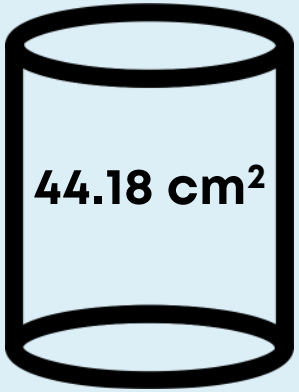
1. Greek
2. Italian x2
3. Turkish
4. Spanish
5. German

1 pupae collection & sex determination

14 DAYS

2 combination of adults
5 males + 5 females

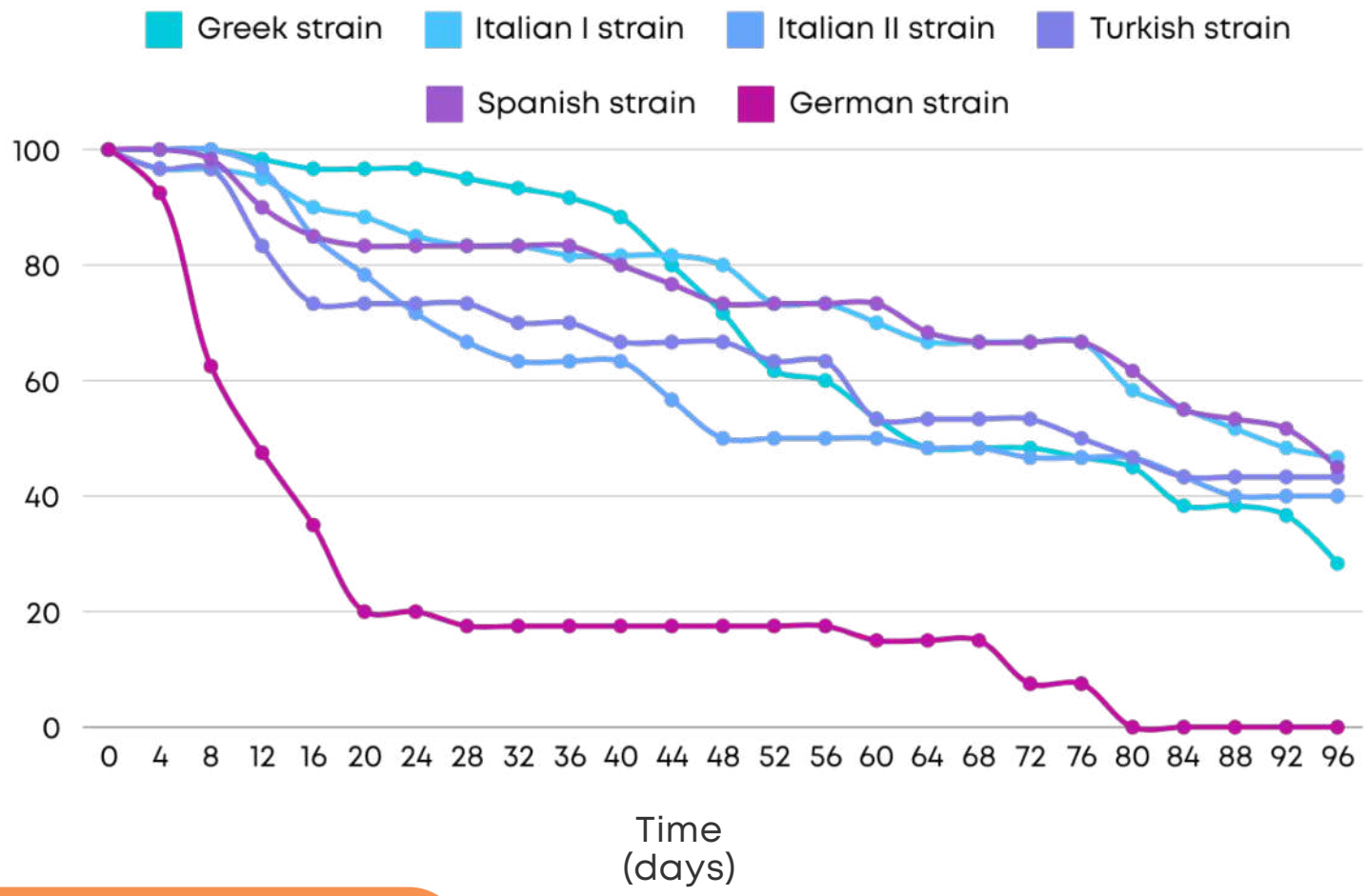
3 Insertion in vials



Larvae collection
8 days after

Egg collection
every 4 days

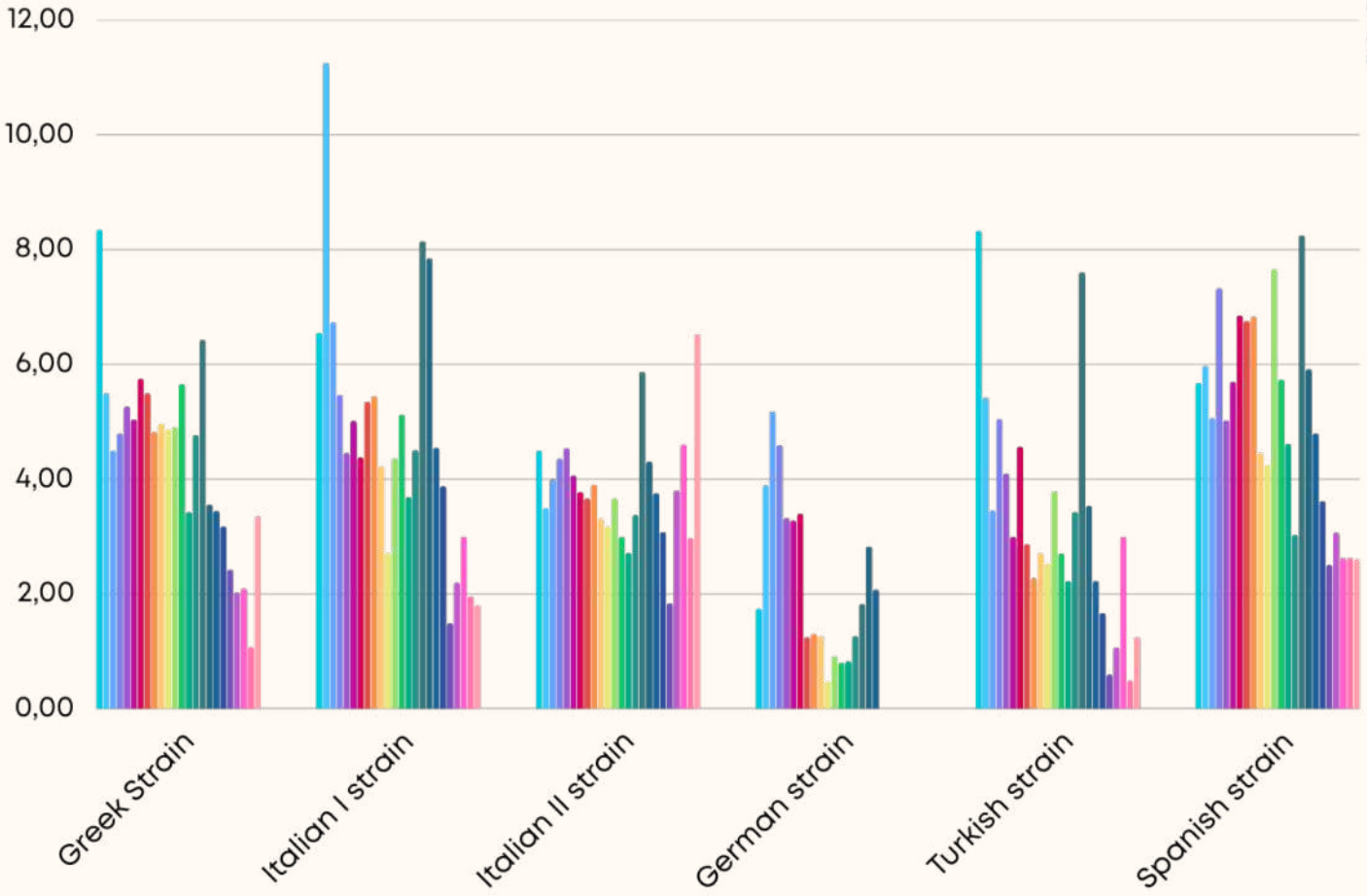
ADULTS' SURVIVAL (%)



Adamaki-Sotiraki, C., Rumbos, C. I., & Athanassiou, C. G. (2022). Strain effect on the adult performance of the yellow mealworm, Tenebrio molitor L. Journal of Insects as Food and Feed, 8(12), 1401-1410.

EGGS PER ADULT

Over a period of 96 days.



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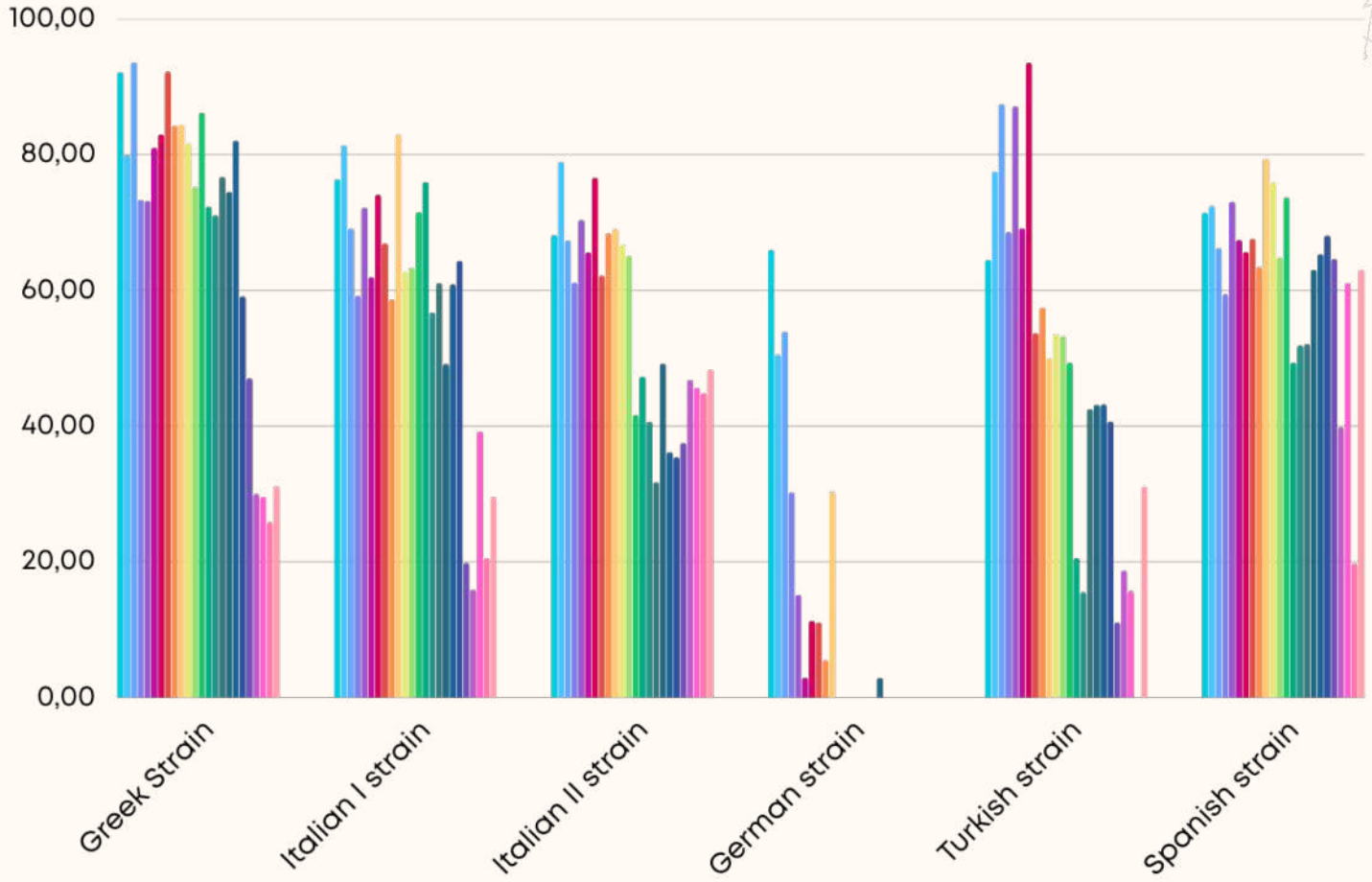
HATCHABILITY (%)

Over a period of 96 days.



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Strain effect on the larval growth of the yellow mealworm, *Tenebrio molitor* L.

7 strains

1. Greek
2. Italian x2
3. Turkish
4. Spanish
5. German
6. USA

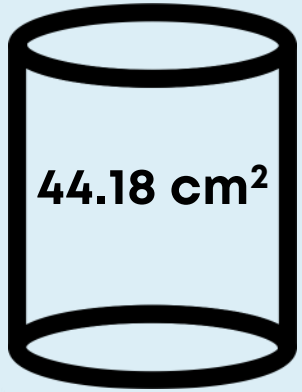
1 50 newly-hatched larvae

2 4g of feed + Carrots

3 Insertion in vials

EVERY 2 WEEKS

Larval survival & Larval weight

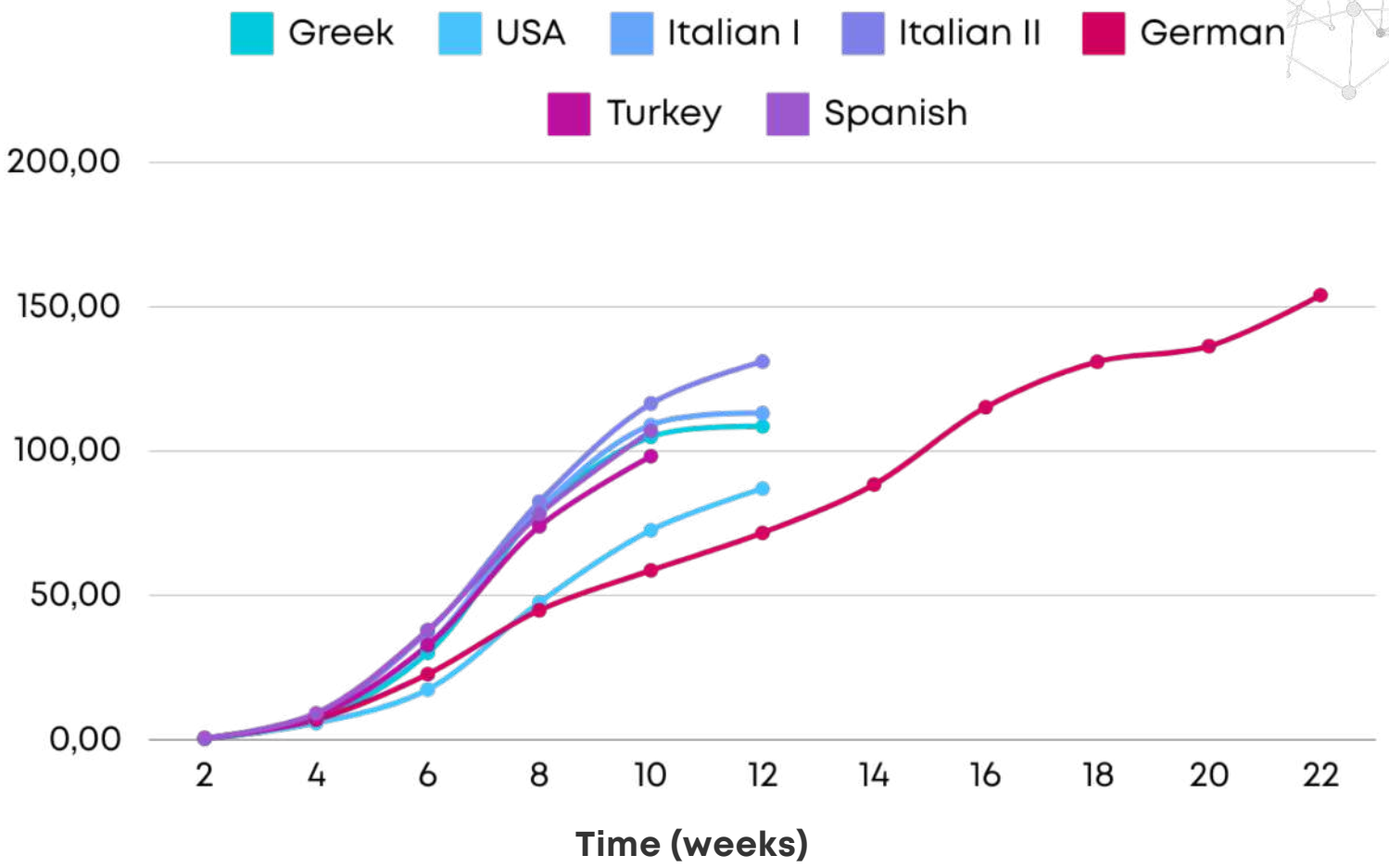


AT TERMINATION

Growth Indixes

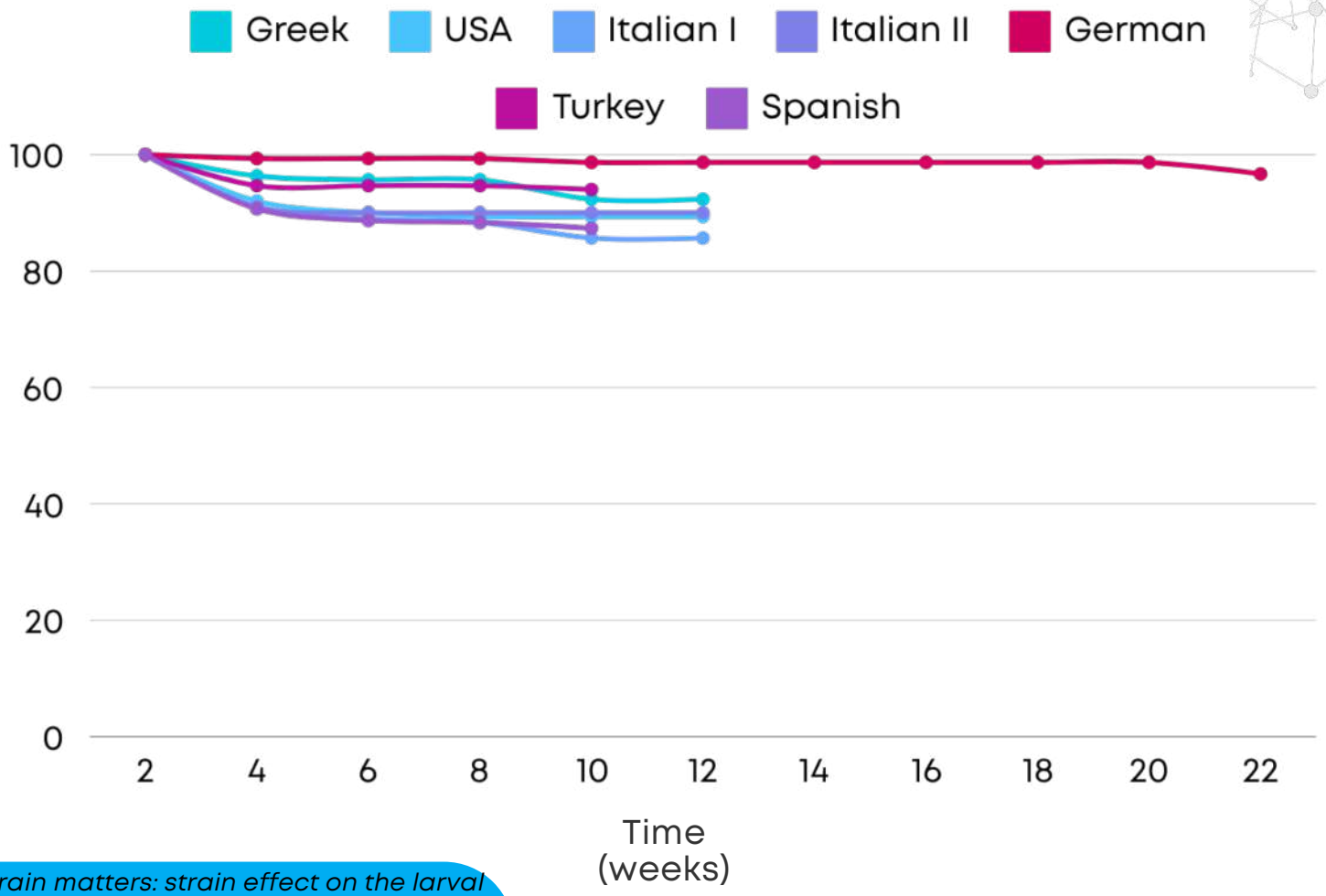
Chemical composition

INDIVIDUAL LARVAL WEIGHT (MG)



Rumbos et al., (2021). Strain matters: strain effect on the larval growth and performance of the yellow mealworm, Tenebrio molitor L. Journal of Insects as Food and Feed, 7(8), 1195-1205.

LARVAL SURVIVAL (%)



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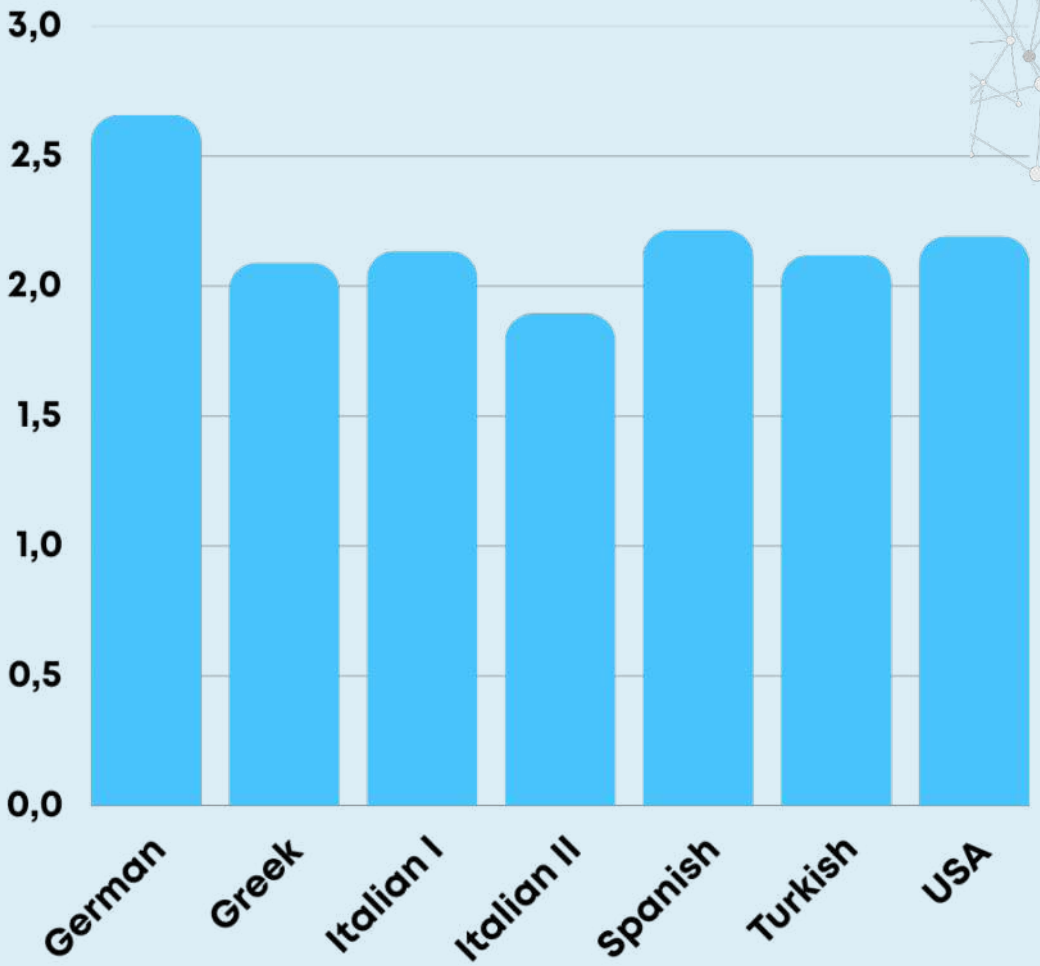
FCR

$$\frac{\textbf{FEED CONSUMED}}{\textbf{WEIGHT GAINED}}$$



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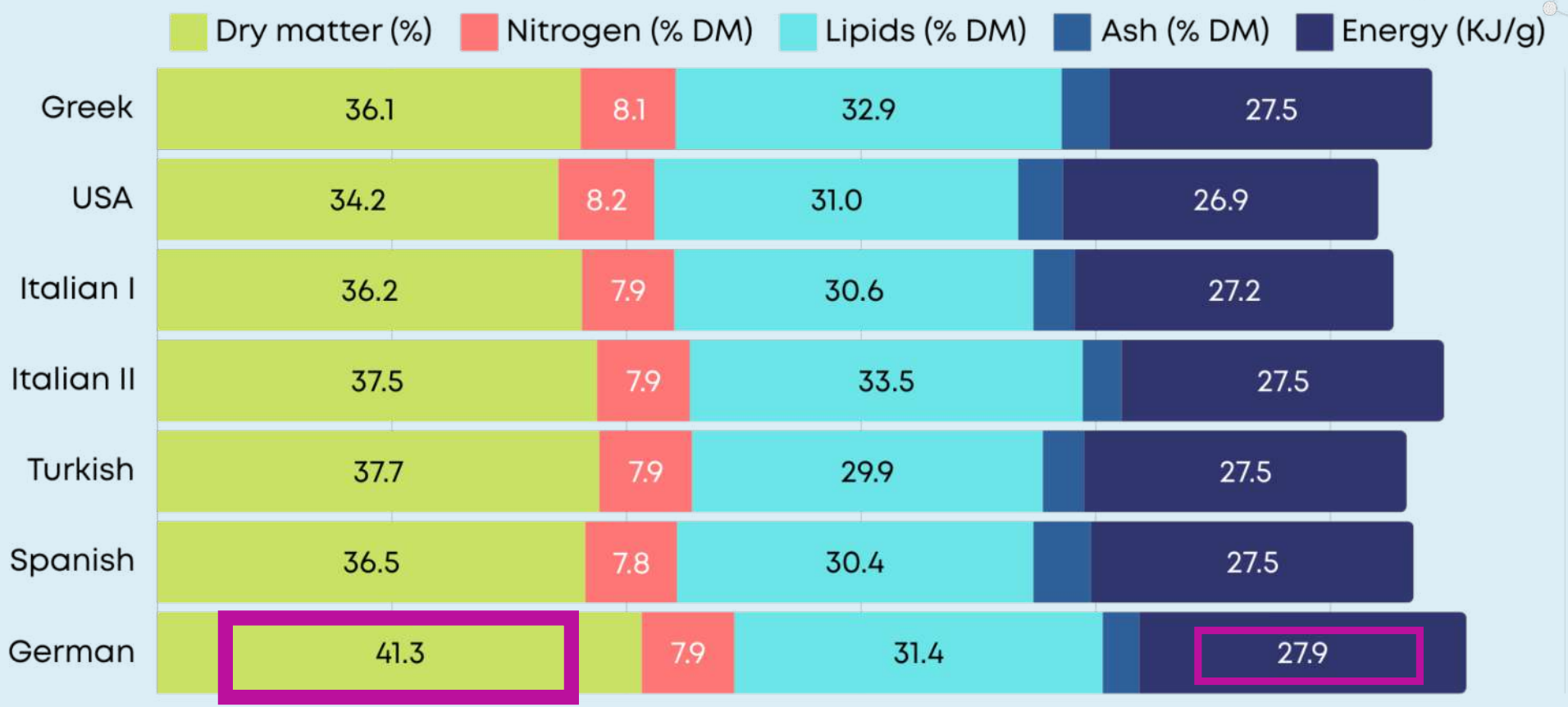
CHEMICAL COMPOSITION OF LARVAE FROM DIFFERENT STRAINS



Differences in performance and production traits emphasize on the importance of selection of strains for mass-production

”The case of the German strain”

HIGHEST larval weight

HIGHEST Dry matters & Energy

SLOW larval growth

LOW adult survival

LOW offspring production

THANK YOU

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