Comparative larval growth of *Alphitobius diaperinus* populations on various substrates

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The lesser mealworm, *Alphitobius diaperinus*

- ✓ Vector of pathogens in poultry farms
- ✓ Secondary stored-product insect pest
- ✓ Edible insect for food and feed

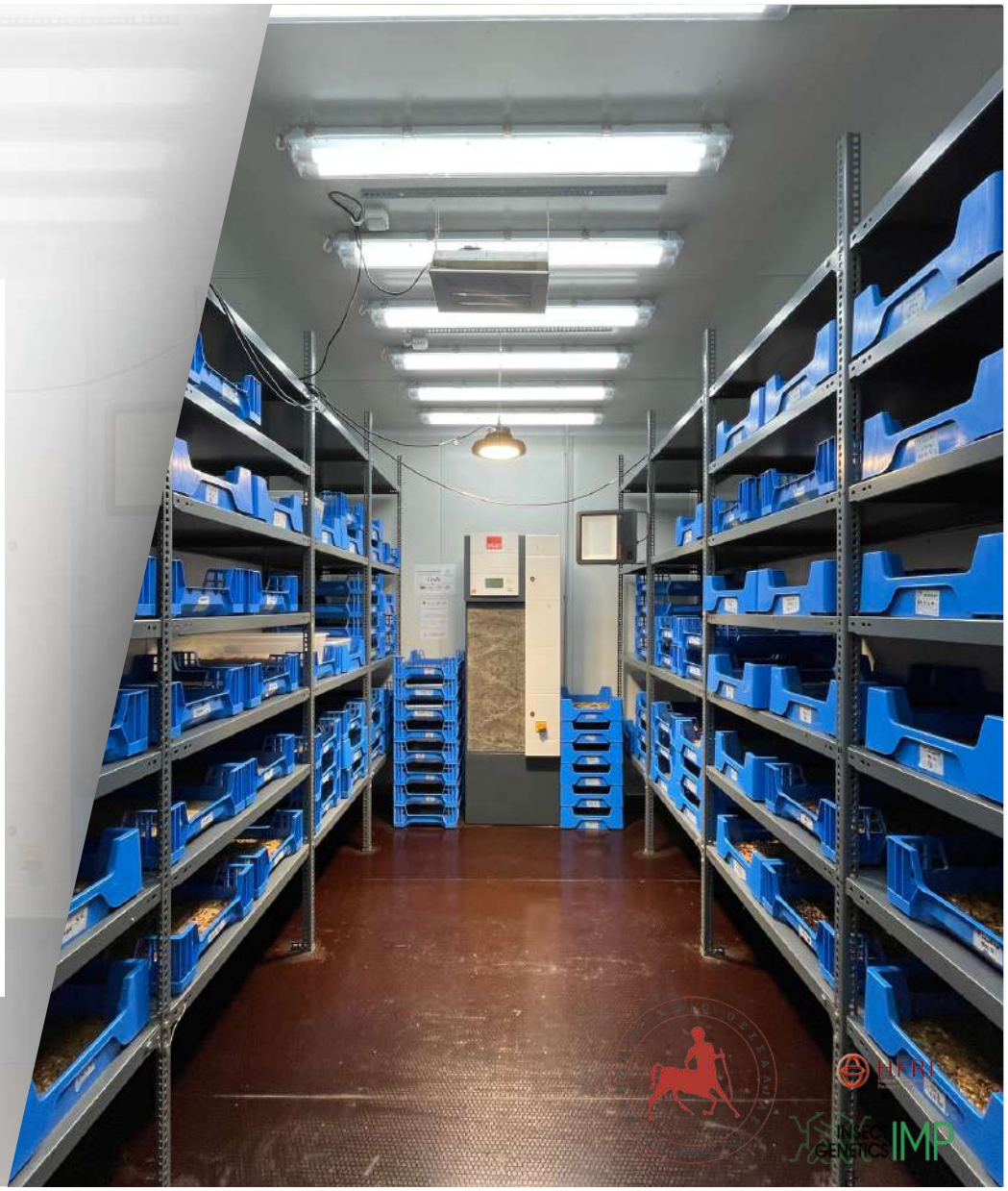
AQUAFEEDS
EU Regulation
2017/893

POULTRY & PIG DIETS
EU Regulation
2021/1372

FOOD
EU Regulation
2015/2283

FEED THE INSECT'S NEEDS

Knowledge gaps regarding the optimization of mass rearing *Alphitobius diaperinus*



VALUES

Feeding Substances & Diets

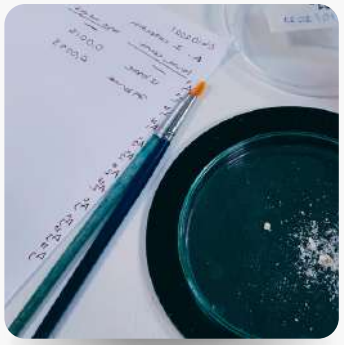
Integrate locally available **agricultural byproducts** for rearing *A. diaperinus* larvae.

Choose wisely your population

Evaluate insect populations based on **desirable traits** that exhibit superior production output.

TRUE OR FALSE?

Can we select insect populations than can efficiently grow on specific, not so favorable, byproducts?



The Contestants

✅ **UTH [GREECE]**

Laboratory population. Brought in 2019 from a local store Greece.

✅ **GRW [GREECE]**

Wild population. Collected in 2021 from a local broiler house in Central Greece.

✅ **USW [USA]**

Wild population. Collected in 2020 from a broiler house in Delaware, USA

✅ **TR [Turkey]**

Semi-commercial meal for bird and fish hobbyists.

✅ **NLT / NLK [NETHERLANDS]**

Commercial populations for insect meal.

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Feed Tracker

Wheat bran

The common byproduct
used as control diet

Rice hulls

Byproduct with toxic traits,
is used only for biogas

Sunflower

Full of lipids,
not suitable for mealworms

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Materials & Methods

Start

50 larvae
per vial
Dry & wet
feed
6 replicates

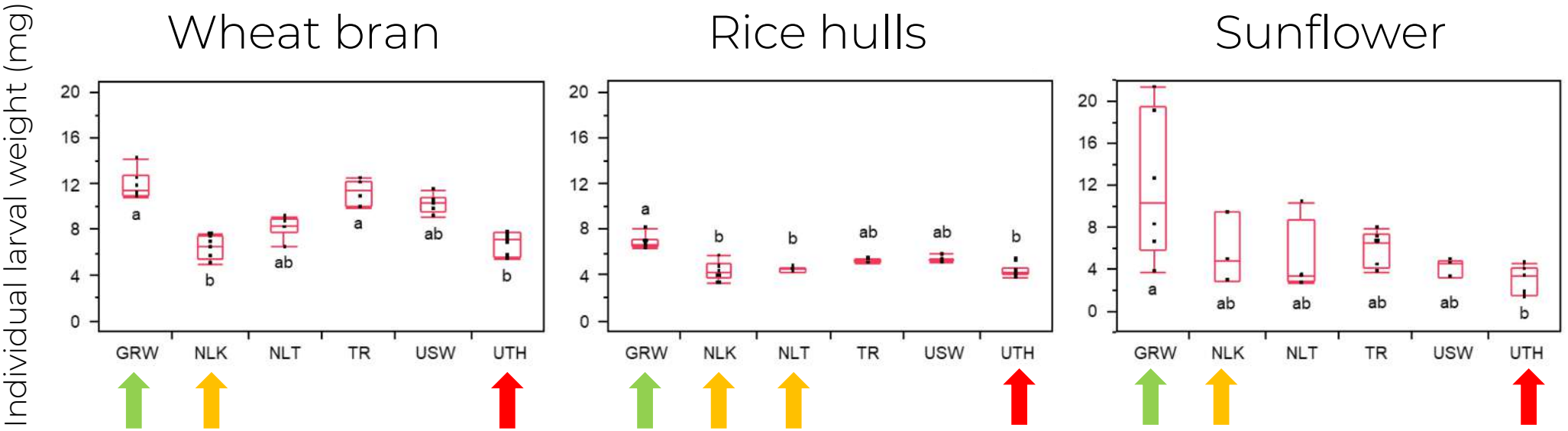
Termination

Emergence
of the first
pupa per vial

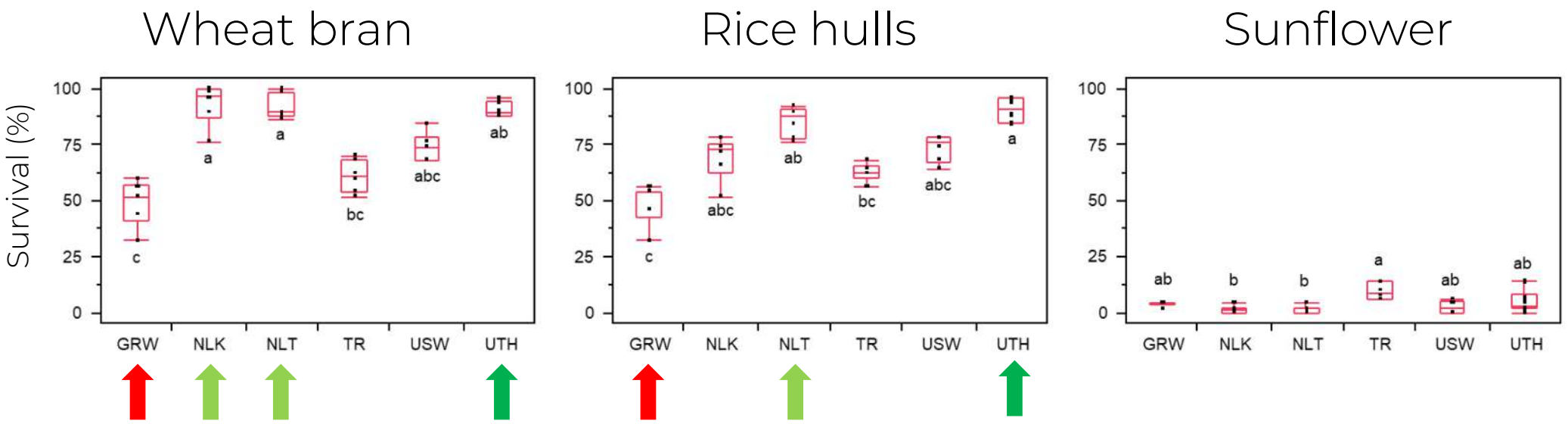
Results

Survival,
Growth,
Specific
Growth Rate

Individual larval weight (mg)

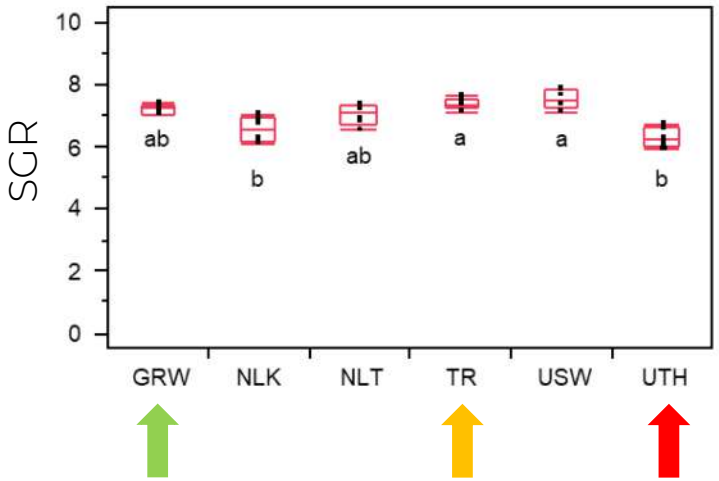


Survival (%)

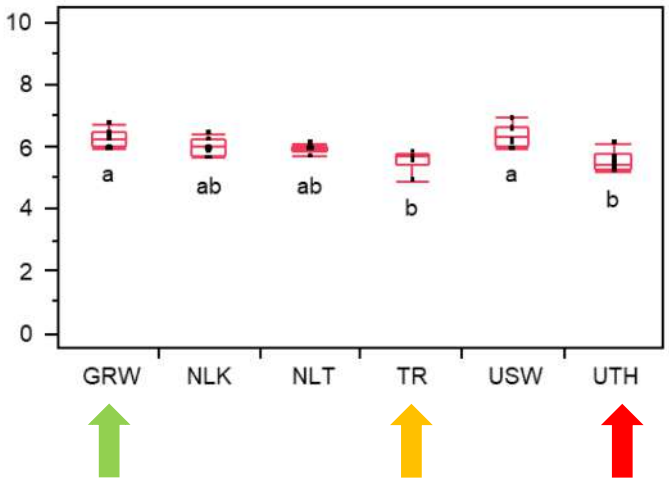

Wheat bran
Rice hulls
Sunflower
Survival (%)
100
75
50
25
0
GRW
NLK
NLT
TR
USW
UTH
c
a
a
bc
abc
ab
c
abc
ab
bc
abc
a
ab
b
b
a
ab
ab

Spesific Growth Rate

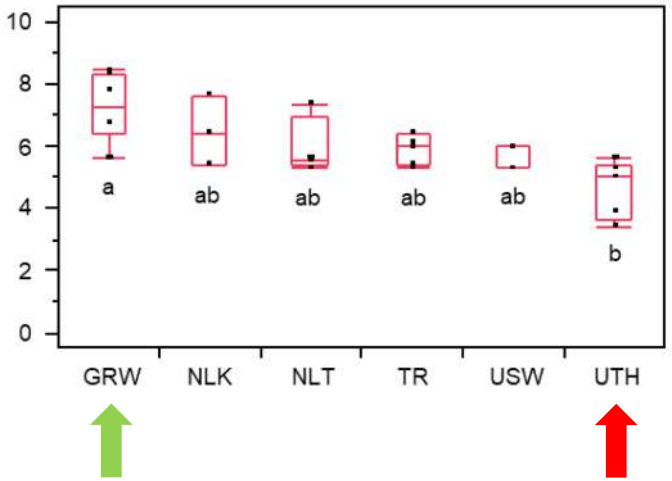
Wheat bran



Rice hulls



Sunflower



TIPS

Sustainability
Integrate locally available agricultural byproducts for rearing *Alphitobius diaperinus*.

Compound feeding diets
Compose diets using a variety of ingredients to suit the nutritional needs of the larvae.

Balanced nutritional profile
The ideal development of larvae may not depend just on the protein content of the feeding diet.

TIPS

Choose wisely
Evaluate strains based on desirable traits that exhibit superior production output.

What has been lost?
Understand the concept of inbreeding in insects.

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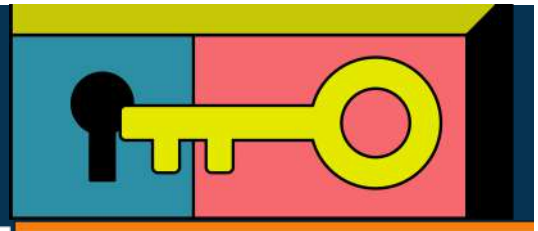

THANK YOU

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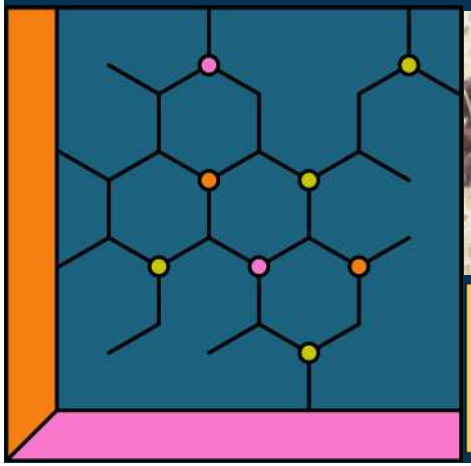

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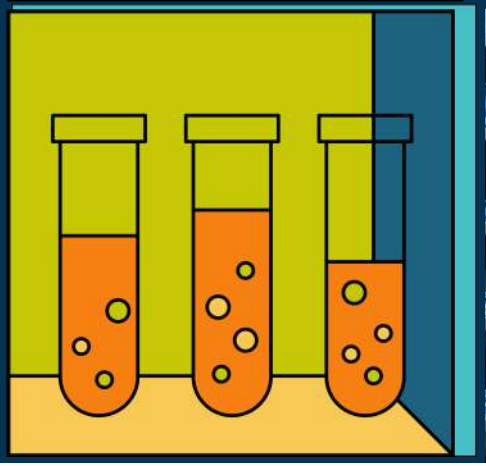

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