



From waste to wealth: Balancing black soldier fly growth through feeding rates and waste-based ingredients

Industry Brokerage Event 2024

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KNOWLEDGE NEED

- The alternative protein sources for aquaculture are needed
- Insects are promising source for sustainable and feasible production
- Numerous studies reported black soldier flies (BSF) as dietary inclusion in different aquatic organisms



KNOWLEDGE NEED

- BSFL meal stimulates specific and non-specific immunity, regulates the intestinal microbiota, survival and growth
- BSF has short development, high fecundity, feed on organic waste, high in nutrients
- Key to enhance the profitability of black soldier fly rearing: diet/biomass ratio.



SOLUTION (RESULT)

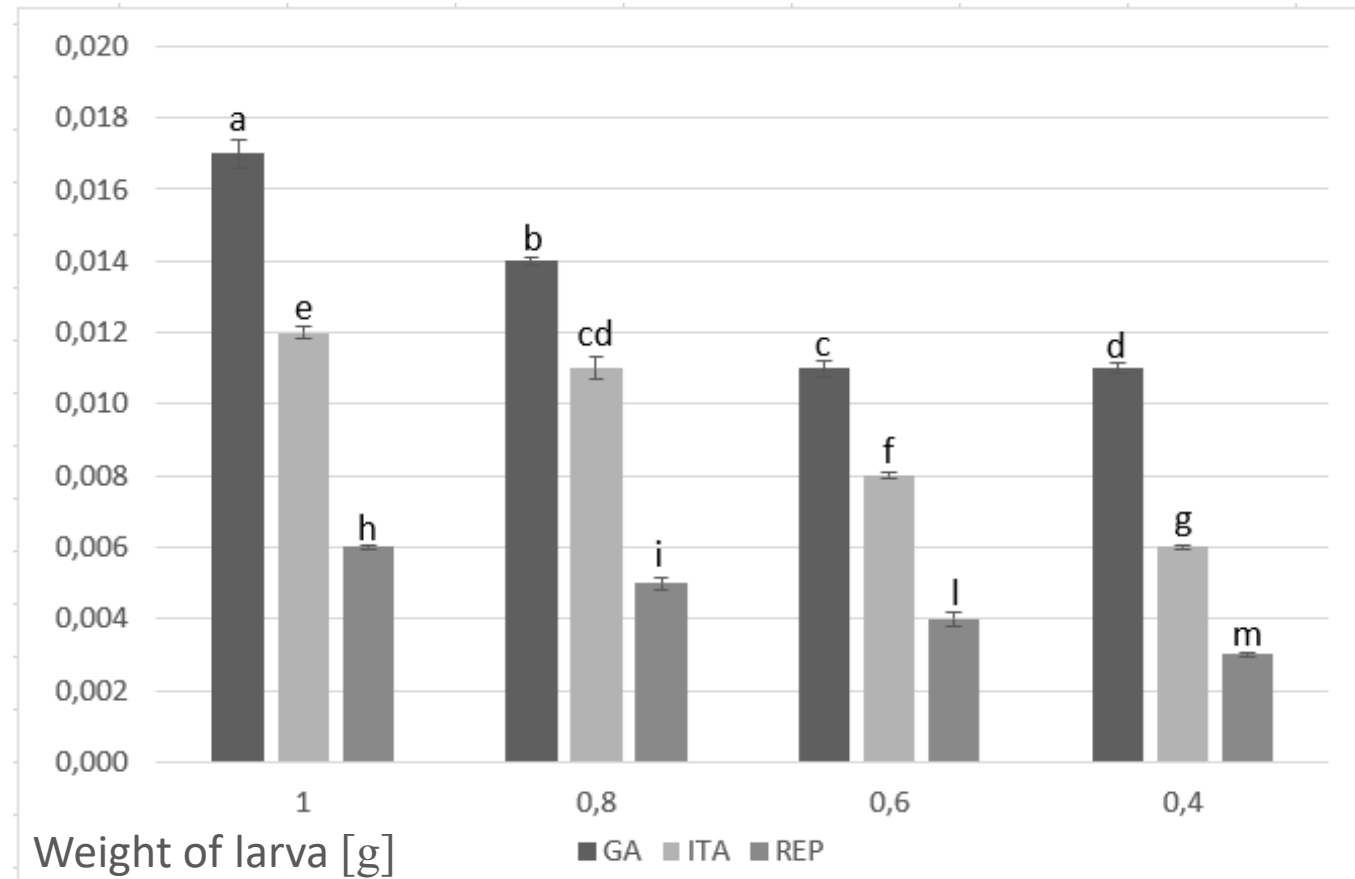
- Two waste-based diets from food industry ingredients from Czechia (REP) and Italy (ITA) compared to Gainesville diet (GA)
- Four feeding rates: 0.4 – 1 g per BSF larva
- 10 000 – 25 000 of 6-days-old BSF larvae were inoculated into 10 kg of diet
- Larval weight was recorded every 2 days
- Harvest: larvae growth between two sampling times < 10%

Diet 1	Diet 2
Cabbage leaves	Oversized fruits
Brewery spents	Fruit pulp
Apple pomace	Buffalo milk whey
Coffee silver skin	Brewery spents
	Rice hulls
	Coffee silver skin



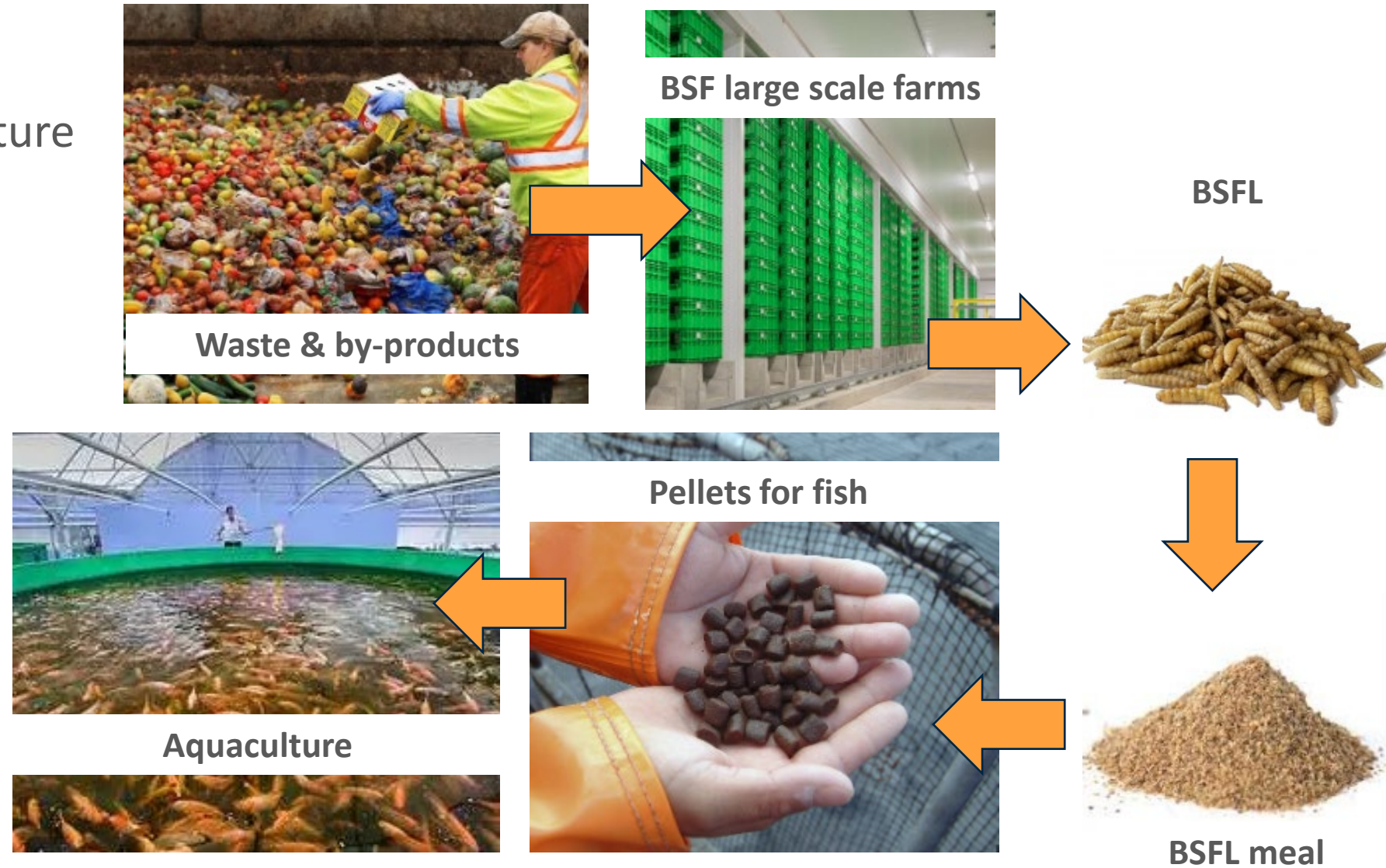
SOLUTION (RESULT)

- BSFL were able to feed and to survive on both experimental substrates
- Weight: the weight was influenced by diets (GA > ITA > REP), and feeding rate
- Reduction rate, Waste reduction index, Bioconversion efficiency: GA > ITA > REP
- Feeding rates: BSF on different substrates have different results



TARGET MARKET

- Food industry and agriculture
- Insect farmers
- Feed producers
- Aquaculture



IMPACT



- BSFL can be reared using local products = **feasible & sustainable**
- The **collaboration between agriculture sector and food industry with insect farms** is highly relevant to use seasonal waste for BSF rearing.
- The optimal feeding **rate feeding rate should be assessed individually** for each substrate.
- Further studies will be required to correlate the nutrient composition of the diet with the feeding rate to provide comprehensive insights.



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