

Valorization of black soldier fly *Hermetia illucens* larvae as an alternative protein source for post-weaning piglet nutrition

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Abstract

Food loss and food waste : one-third of food produced human consumption.
The consequences of a growing population and excessive food consumption :

- Increase in greenhouse gas emissions (CO₂, N₂O, CH₄).
- Eutrophication of the environment.
- Land use change, loss of biodiversity.
- Spread of humans and livestock diseases.
- Pressure on animal proteins.

Black soldier fly (*Hermetia illucens*) efficiently valorizes biowaste :

- High-quality proteins.
- Lipids.
- Compost

The objective of this study is to recycle biowaste into *H. illucens* proteins in order to feed post-weaning piglets.



Materials and methods

Fruits and vegetables, bread, brewer's grains.

Digester :

- Grinding.
- Heating 50°C.
- Microorganisms.

Produces storable and rewettable flour.



Analyzes of larvae fed with re-moistened flour :

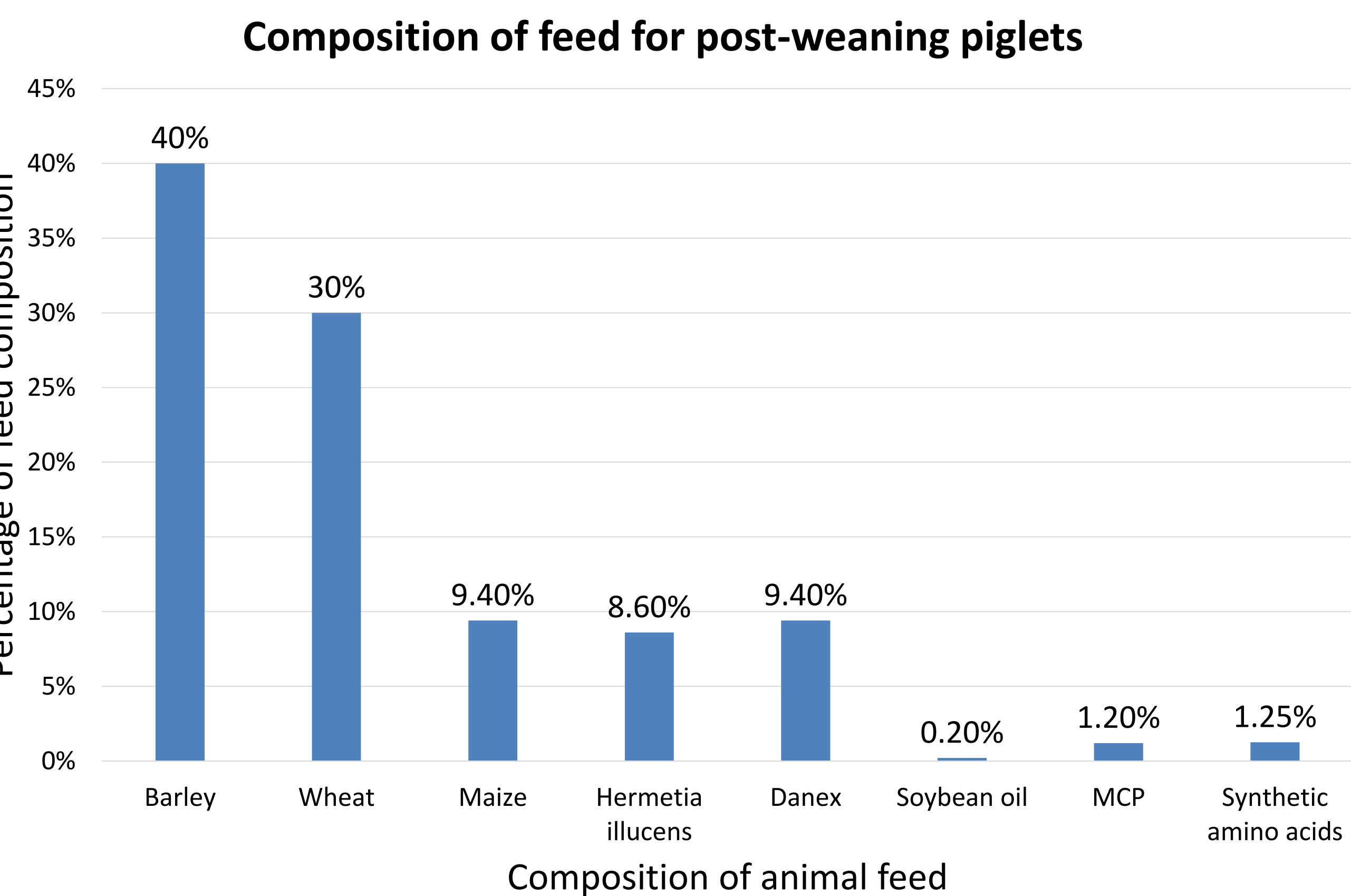
- Proteins.
- Amino acids.
- Lipids.
- Fatty acids.
- Digestibility.
- Ash.



Results

A total of 4730 kg of bio-waste was recycled to produce 555 kg of fresh larvae. The profile of insect meal was analyzed in order to formulate a diet for post-weaning piglets. The price of the food with the greatest quantity of insects is 1650 euros/ton

Min %	Nutrient	Insect meal %
17,00	Crude protein	51,49
5,00	Lipids	16,26
0,00	Indigestible carbohydrates	9,17
0,60	Calcium	4,58
0,55	Phosphorus	0,03
1,09	AID Lysine	2,59
0,35	AID Methionine	0,62
0,22	AID Tryptophane	0,14
0,68	AID Threonine	1,54
10,26	Net Energy (MJ/kg)	11,30
2450,00	Net Energy (kcal/kg)	2690



Discussion

This experiment made it possible to produce black soldier fly larvae from biowaste (fruits and vegetables, brewers' grains and bread). On the nutritional basis of insect meal, it is possible to formulate a feed for post-weaning piglets containing 8.6% black soldier fly and having a price of 1650 euro/ton.

An experiment on piglets will make it possible to test different inclusion rates of insect proteins in order to assess their impact on the development and health of the animals.