

Insect farming

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Insect farming is the practice of raising insects for agricultural purposes. It can either be used to fight invasive species, to create industrial products such as petroleum or to grow inexpensive and environmentally sustainable food for humans or animals.^{[1][2][3][4]}

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Rationale

Overview

Insects offer a highly economical, sustainable solution to existing and looming issues with the production and distribution of high quality protein to help meet growing demands as the world population grows and increases its protein consumption. Insects have a high nutritional value, probiotic potential, and affordable price. Insects such as crickets and worms have high concentrations of amino acids, vitamin B12, riboflavin, vitamin A, etc.; They are a good source of protein. Insect farming is much cheaper than cattle farming and requires much less energy. Cattle feedlots require a huge amount of energy and money to raise and feed cattle, remove waste and to keep them healthy. Insects are grown in their naturally based places, in a normal and healthy ecosystem. Organic waste from plant harvest and processing feeds large populations of worms. Worms turn the waste stream into high quality fertilizer that can nourish the next generation of plants growing. Insects and other crops can support each other and provide a surplus of each other to farmers.

Benefits

Reduced feed

Typical cattle requires roughly 8 pounds of feed to produce a single pound of beef. Insects on the other hand require only 2 pounds of feed to produce 1 pound of meat, making them four times as efficient. Much of this efficiency comes about because bugs get their heat from the environment instead of having to create their own body heat like typical mammals.

Nutrient efficiency

Insects are nutrient efficient compared to other meat sources. Locusts for example contain between 8 and 20 milligrams of iron for every 100 grams of locusts. Beef on the other hand contains roughly 6 milligrams of iron in the same amount of meat. Crickets as well are very efficient when you compare nutrients. For every 100 grams of substance crickets contain 12.9 grams of protein, 121 calories, and 5.5 grams of fat. Beef contains more protein containing 23.5 grams in 100 grams of substance, but also has roughly 3 times the calories, and four times the amount of fat as crickets do in 100 grams. So,

per 100 grams of substance, crickets contain only half the nutrients of beef, except for the iron which may be of benefit to menstrual women. High levels of iron are implicated in bowel cancer^[5] and heart disease.^[6]

Greenhouse emissions

The raising of typical livestock causes almost 20% of all the greenhouse gases created. Alternative sources of protein in the average diet such as insects lowers the amount of livestock needed and can help lower greenhouse gases created in the process.

Land usage

Many animal farms contain pastures to allow livestock to graze. According to onegreenplanet.org raising animals for food uses up to 30% of the Earth's land mass. On top of this almost 80% of ammonia that the U.S. produces comes from animal excrement. Using insects as part of the diet could replace some of the required space currently used for livestock. And given the size of insects and how fast they reproduce much less land is required to produce meat.

Farming of popular insects

Crickets

Among the different types of crickets, the house cricket is the most common type to be used for human consumption. House crickets only live up to about eight weeks. Until they are twenty days old they are fed high protein animal feed, most commonly chicken feed, that contains either 14% or 20% of protein. Once they finally reach twenty days old they can be fed a mixture of the two. A few days before harvesting the crickets at forty-five days old the crickets are fed various vegetables such as pumpkins, cassava leaves, morning glory leaves, and more. This is done to improve the taste of the insects and reduce the use of the expensive, high protein animal feed.

Meal-worms

In order for the meal-worms to live long enough to harvest they must be kept at a temperatures of 75 to 80 °F (23.9 to 26.7 °C). When raising meal-worms farmers must avoid using wood containers to hold them due to the fact that the meal-worms will simply eat through the wood or climb up the walls to escape. It is also important to make sure that they have enough ventilation. The meal-worms must be kept on a proper bedding of wheat middling and things such as maize, cornmeal, and other nutritional powders can be added into the bedding to ensure the meal-worms have enough nutritional value for human consumption. For moisture within the container insect farmers usually use fruits and vegetables on top of the bedding provided for the meal-worms. The fruit or vegetable has to be changed every few days to prevent any mold growth within the container to contaminate these edible insects.

Methods

Breeding insects share similarities and differences with the breeding of larger animals. Due to the high amount of insect species, breeding techniques are mostly insect-specific. Difficulties are also specific. This means that the solution for a breeding problem with meal worms for example will most probably be ineffective for a similar problem with a cricket breeding. Furthermore, the technical requisites of the breeding have to be made compatible with the awaited economical profit. Insect breeding requires therefore two kinds of skills: 1. mastering rearing techniques 2. mastering analytical methods for choosing the rearing techniques which are best adapted to the economical conditions.

Footnotes

1. Want to Help the Environment? Eat Insects
(http://discovermagazine.com/2008/may/07-want-to-help-the-environment-eat-insects/article_view?b_start:int=1&-C=)
2. Insect Farming and Trading Agency (<http://www.ifta.com.pg/>)

3. Insect Farming, by Brian Robertson & David Whittaker (<http://www.seekbooks.com.au/book/Insect-Farming/isbn/9780733969423.htm>)
4. Marcel Dicke - "Why not eat insects?" (http://www.ted.com/talks/marcel_dicke_why_not_eat_insects.html)
5. http://www.medscape.com/viewarticle/502752_4
6. <http://www.webmd.com/heart-disease/news/20001025/too-much-iron-may-lead-to-heart-attack>

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- Breeding Meal-worms (<http://www.drsfostersmith.com/pic/article.cfm?aid=2379>)

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(<https://www.theguardian.com/environment/2010/aug/01/insects-food-emissions>), The Guardian
- One Green Planet
(<http://www.onegreenplanet.org/animalsandnature/facts-on-animal-farming-and-the-environment/>)
- Insect farming research & edible insect species list
(<http://www.thefarmedinsectcompany.com/>)
- Professional Insect Rearing. Strategical points and management method, Books on Demand, ISBN 9782322042777, November 2015.

See also

- Entomophagy
- Butterfly ranching in Papua New Guinea
- Insect Farming and Trading Agency
- Welfare of farmed insects

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Categories: Agriculture by type | Insect rearing

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