

Edible Insects as Alternative Way to Traditional Non-Veg Food, Future Prospects for Food and Feed Security

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SUMMARY

The practice of eating insects is known as entomophagy. Edible insects have always been a part of human diet, but in some societies there is a degree of distaste for their consumption. The most commonly eaten insect groups are beetles, caterpillars, bees, wasps, ants, grasshoppers, locusts, crickets, cicadas, leaf and plant hoppers, scale insects and true bugs, termites, dragonflies and flies. Although the majority of edible insects are gathered from forest habitats, Innovation in mass-rearing systems has begun in many countries. Insects offer a significant opportunity to merge traditional knowledge and modern science in both developed and developing countries. Since 2003, FAO has been working on topics of edible insects worldwide in many countries. Contributing in Generation and sharing of knowledge through publications, Awareness through media, Collaboration with newspapers, magazines and TV and Networking and multidisciplinary interactions. Concern with health insects can be alternative source of chicken, fish, and pork because they are rich in protein, high in calcium, iron, zinc etc. Insects emits less greenhouse gases as compared to livestock. There is no land clearing required expand production and insect rearing. They converting feed into protein and organic waste as food. So, in future they can be used as alternate source.

INTRODUCTION

In 2050 world will be host of nine billion peoples and it is widely accepted. To accommodate this number, current food production will need to almost double. Land is scarce and expanding the area devoted to farming is rarely a viable or sustainable option. Insect as food & feed is emerging issue of 21st century due to the rising cost of animal protein, food and feed insecurity, environmental pressure, population growth and increasing demand for protein among the middle classes. It is estimated that insects form part of the traditional diets of at least 2 billion people. More than 1900 species have reportedly been used as food (Jongema, 2012). The practice of eating insects is known as entomophagy. The most commonly eaten insect groups are beetles (31%), caterpillars (18%), bees, wasps and ants (14%) grasshoppers, locusts and crickets (13%), cicadas, leaf and plant hoppers, scale insects and true bugs (10%), termites (3%) and dragonflies (3%).

Entomophagy and Religion

The practice of eating insects is cited throughout religious literature in the Christian, Jewish and Islamic faith. The Bible speaks of locusts as food in the book of Leviticus. There are several references in Islamic tradition to insect eating, including locusts, bees, ants, lice and termites (El-Mallakh and El-Mallakh, 1994).

Entomophagy in Ancient Times

The history of entomophagy is well documented by Bodenheimer (1951). Insects are healthy, nutritious alternatives to mainstream staples such as chicken, pork, beef and even fish. Many insects are rich in protein and good fats and high in calcium, iron and zinc (Roos, 2012) and Bukkens (2005). Insects release less greenhouse gases (GHGs) & ammonia emissions than most livestock. Insects converting feed into protein. Insect harvesting/rearing is a low-tech,

low-capital investment option that offers entry even to the poorest sections of society, such as women and the landless. Since 2003, FAO has been working on topics pertaining to edible insects in many countries worldwide and contributing in sharing of knowledge, publications, expert meetings and a webportal, awareness through media, collaboration (e.g. newspapers, magazines and TV), networking and multidisciplinary interactions (e.g. stakeholders) and also playing role in documentation, conferences.

Insects can be found in abundance throughout the African continent and when staples are scarce they become important sources of food. Edible insects as natural resource e. g. - weaver ants (*Oecophylla smaragdina*) (Sribandit *et al.*, 2008). Insects such as the desert locust (*Schistocerca gregaria*), common housefly maggots (*Musca domestica*) and domesticated silkworm (*Bombyx mori*) are fed as Poultry and fish feed (Rutaisire, 2007). In Thailand crickets are reared simply in sheds in one's backyard as new concept of insect farming. Strategic issues for industrial-scale insect farmers are 1. Creating an international society of producers of insects as food and feed to complement 2. Developing a code of practice/standards and product quality metrics 3. Developing a marketing strategy 4. Creating a list of species that are "society approved" for use as human food and 5. Centralizing information, literature, methods and practices.

Why are insects consumed in the tropics more than in temperate areas of the world?

- Larger in size
- Large quantities can be collected during a single harvest.
- Ex- Locust swarms settle for the night, making harvesting very easy in the evening and early morning
- A variety of edible insect species found in the tropics
- Predictability of location and occurrence eg. Location Ex - Palm weevil and emergence of seasonal insects
- Time of abundance (often depending on rains)

Why insects were never domesticated for food?

- Insects are considered delicacies in many parts of the world
- The domestication of animals and plants took place thousands of years ago
- The Fertile Crescent, China, India, Mesoamerica (central and southern Mexico and adjacent areas), the Andes of South America and the eastern United States all boasted food production from a very early time (Diamond, 2005)
- There are 148 species of large terrestrial mammalian herbivores and omnivores weighing at least 45 kg.
- Out of this 14 animals are well domesticated commonly

Negative attitudes towards insects

- Insect harvesting has been associated with the hunter-gatherer era and in turn with "primitive" forms of food acquisition
- Insects word have come to be seen as mere pests (Pimentel *et al.*, 1975; Pimentel, 1991).
- Insects are virtually synonymous with nuisance: mosquitoes, flies, termites
- Certain insects are also transmitters of disease (Kellert, 1993) Ex- Biological vectors of diseases such as mosquitoes, ticks, fleas and lice, house fly *etc.*
- Arthropods such as spiders have been associated with disease and infection
- Few people realize that most insects are beneficial and that very few are damaging
- some missionaries (Christian person) have condemned winged termite eating as a heathen custom.

Future thrust

- Further documentation is needed on the nutritional values
- The environmental impacts of harvesting and farming insects must be investigated
- Clarification and augmentation of the socio-economic benefits that insect gathering and farming can offer is needed
- A clear and comprehensive legal framework at international and national levels is needed

CONCLUSION

For the increasing population food security is the major problem. Cereals and fruits not keeping pace with increasing population. Beef pork *etc.* are the having religious tabu or taboo. So, alternative way is that edible insects. Also as feed for commercial poultry and fish production.

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