



## **Alternative Food/Feed And The Impacts On Food Security -A Case Study.**

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### **ABSTRACT**

This study discuss challenges ,trends ,practices and proposed solutions of Alternative Foods and its impact on Food Security. Due to more health concern developed in people more and more individuals are attracted towards healthy alternative foods. UAE's sintaxes on energy drinks, soft drinks and cigarettes has also been a great revolution to change mind of people. Variety of trainings, open discussion and seminars conducting by food security department of concerned countries has made remarkable change in the life style, which in turns decrease food wastage, following healthy life style, planting trees, preserve nature thereby a direct impact on food security. By concerning different factors affecting the food security globally and UAE specifically ,several innovative researches, ideas and target vision has been proposed by UAE 's Minister of State of Food Security in the coming up years.

**Keywords:** Alternative Foods, Food Security, Food demand and supply, Insects as Food and Feed, Chloroidium alga, Umami. Role of UAE in the Food Security,

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## Summary

### 1. Introduction

Food consumption is growing at the rate of 12% a year. Looking at the climate change and global food demand, UAE is trying to ensure different plans in place to secure food for today and future is the home to people of over 200 nationalities their eating patterns, and the way they deal with food wastage and loss. Rising population along with the projected increases in the capital income in developing countries will undoubtedly put severe pressure on the world food security system, this in turn forces food industry has tended to look for alternative sources of food production.

### 2. Alternative Foods And Its Demand And Role In Food Security

Alternative /replacement foods are based on the substitution of one constituent with the another and these should have the similar or same attributes to ensure optimal organoleptic, optimal and functional performance

2.a) UAE has identified algae as the potential source of food production and remarkable role in medicines and oil. The strain of **Chlorodium alga (Single celled green algae)** was found in the coastal beaches, mangroves and desert areas-**Researches from New York University Abu Dhabi**. The diverse set of genes and proteins helps them to consume 40 different varieties of carbon source to produce energy. Its ability to adapt with twice salinity of seawater make it a “**GEM**” in the Food security of future endeavors. **Palm oil from algae**-contains adaptable traits for desert acclimatization. A

similar composition of oily molecules opens the possibility of growing the algae as an alternative to oil palm trees.

**Deforestation and devastation of rain forest through out in Asia which is a significant environmental and Food insecurity concern can be solved by large scale production of algae. -NYUAD RESEARCHES**

### 2.b) **Healthy Alternative To Soft Drinks**

UAE imposed 100% tax on energy drinks and 5% tax on soft drinks had a good impact of people health to help to build a healthier society since this resulted in decrease in consumption of these products which indirectly target obesity rates, and increased consumption of fruit infused water, carbonated water and also fresh juices. (survey from-Gulf News, October 2.2017)

2.c) **Umami (Fifth Basic Taste)**-A natural occurring glutamate that delivers the subtle, the savory taste of beef. Foods with big umami impact includes mushrooms, tomatoes, sweet potatoes, fermented seaweed, soya sauce etc. Since UAE is a burger town, this will help the generation to skip unhealthy Burgers, meat broths and attract them to have healthy saturated foods like fish veg burgers and veggie broths with similar taste flavor of former. A typical eg, Shiitake mushroom (mushroom having Strong Umami taste) sea salt, olive oil, mix all properly place in the oven at 350°C for an hour resembles exactly as “bacon”.

The innovation of umami make a remarkable effect on food security, more people attract towards healthy life style, all have access to sufficient, safe, nutritious to maintain a healthy and active life rather than concentrating on unhealthy foods.

### 2.d) **Alternative Feed.**

Insects as alternative Food and Feed

Due to high cost of commercial feeds people now tend to resort alternative feeds. Because of growing demand for meat and declining availability of agricultural land, there is an urgent need to find alternative protein sources. Edible insects can be produced with less environmental impact than livestock. They have adequate protein quantity and quality and high content of unsaturated fatty acids and minerals like iron and zinc. Promotion of insects as food and feed will require the insects to be farmed. **According to the world Food Security committee the four pillars of food security are availability, access, utilization and stability; while the nutritional dimension is considered integral to the concept of food security.**

Insect can be considered as human food or as feed for pets, livestock and in aquaculture. Insect production seems to be more sustainable than livestock production for a number of reasons: lower greenhouse gas and ammonia emissions, less land area needed, more efficient feed conversion, and potential to be grown on organic by-products of which 1.3 billion tons is produced globally per annum.

Appropriate palatability of insect meal for poultry, pigs, fish species and ruminants was demonstrated and insects could replace 25–100 % of soymeal or fishmeal depending on the animal species. The production of fishmeal and fish oil has diminished from 30 million tons (live weight) in 1994 to 16 million tons in 2012.

They provide satisfactory energy and protein, meet amino acid requirements for humans, are high in monounsaturated fatty acids and polyunsaturated fatty acids, and rich in several minerals and vitamins. Of particular interest are the high iron and zinc content in comparison to conventional meat. This review explores whether it is timely and appropriate to start considering insects as a sustainable and viable food and feed resource that can contribute to food security.

## **2.e) Black Soldier Fly-Role In Alternative Feed**

A recent study by the United Nations' Food and Agriculture Organization found that 1.3 billion tonnes of food - roughly one third produced globally - is lost or wasted every year.

A humble creature called the black soldier fly – or, to be more precise, its larvae – plays a central role in this alternative method.

Like all maggots, black soldier fly larvae are creatures that few of us would find attractive. But they are especially useful in their ability to process food waste and in themselves as a source of nutrition.

At the National University of Singapore (NUS), Ms Almheiri learned about how this fly, known scientifically as *Hermetia illucens*, can turn food waste into two useful products: plant fertiliser (produced by the larvae from the food waste) and **animal feed** (what the larvae become). The animal feed that the black soldier fly produces is rich in proteins, fats and chitin, the material that their shells are made from. In a single day they can consume four times their body weight. That means that 100kg of larvae can process hundreds of kilograms of food waste every 24 hours.

What makes the method all the more impressive is the amount of waste product that it generates – precisely zero.

Fishmeal is sometimes seen as less than sustainable, since it can be made from wild-caught fish in one area before being sent to fish farms halfway across the world. There are also sustainability concerns linked to another alternative animal feed, soy

**The UAE, which aims to recycle 75 percent of food waste by 2021, is just the kind of nation where the system would work, because the black soldier fly grows faster and reproduces year-round in warmer climates.** We can expect more Alternative Feed which will be valuable achievement to support Food Security

### **3.Vision And Growth Of UAE In The Area Of Food Security.**

United Arab Emirates was one of the leading countries who realized the importance of food security in its developmental journey. Since its inception until today, this interest in food security have taken it's organizational and administrative form in the last couple of years. In 2008 when some of the food items have gone up in price, a committee was formed to cover Emirate of Abu Dhabi called "food security committee".

The committee prime objective is to develop and approve the food security strategy in addition to make a strategic reserve available across all emirates of UAE. This effort has been translated in 2010 when the government established Food Security Centre which developed the food security strategy for UAE.

UAE continues its effort to ensure food security for its future generation, looking to various alternative food options as well as sustainable agricultural practices' state minister of Food Security and delegates had visited several countries ,the team reviewed utilization of **applied research and robotics** in harvesting and to minimize food loss in value chain.The insights of visit helps to finalize UAE'S National Food Security strategy which will be released in September 2019.

UAE will be the world's best in the world food security Index by 2051 and among the top 10 countries by 2021-Mariam Al Muhairi (state minister of food security).

**The Current rating of UAE is 31.**

The strategies enables:

- \*Build an effective Food Security governance model.**
- \*Establish and implement a national R&D Food Security agenda.**
- \*Develop national Food Security Database.**
- \*Build human capacity to shift Food Security functions**
- \*Engage human capacity to shift food security notions and behaviours**

"Singapore is no:1 in the Global Food Security Index even though it imports 90% of its food, because it has managed to access to food at all times".-Mariam Al Muhairi.

### 3.a) UAE Food Security, Strength and Weakness -An Overview

<b>STRENGTH</b>	<b>WEAKNESS</b>
<ul style="list-style-type: none"><li>• Economic stability;</li><li>• Political stability</li><li>• Strong diplomatic relations;</li><li>• High GDP;</li><li>• Strong trade relations with diversified partners;</li><li>• Good infrastructure including</li><li>• Ports' infrastructure;</li><li>• Logistical hub and Transport hub<sup>21</sup>.</li><li>• Positive global standing;</li><li>• Strong regulatory frameworks;</li><li>• Access to labor and highly-qualified human resources;</li><li>• Access to capital;</li><li>• Low tariffs and barriers to trade;</li><li>• Stable currency;</li><li>• An abundant and inexpensive energy supply.</li></ul>	<ul style="list-style-type: none"><li>• Lack of arable land</li><li>• Water scarcity;</li><li>• Hot climate;</li><li>• Insufficient investment in agricultural research;</li><li>• Fossil-fuel based economy;</li><li>• High levels of food waste and overconsumption</li><li>• Dependency on desalination</li></ul>

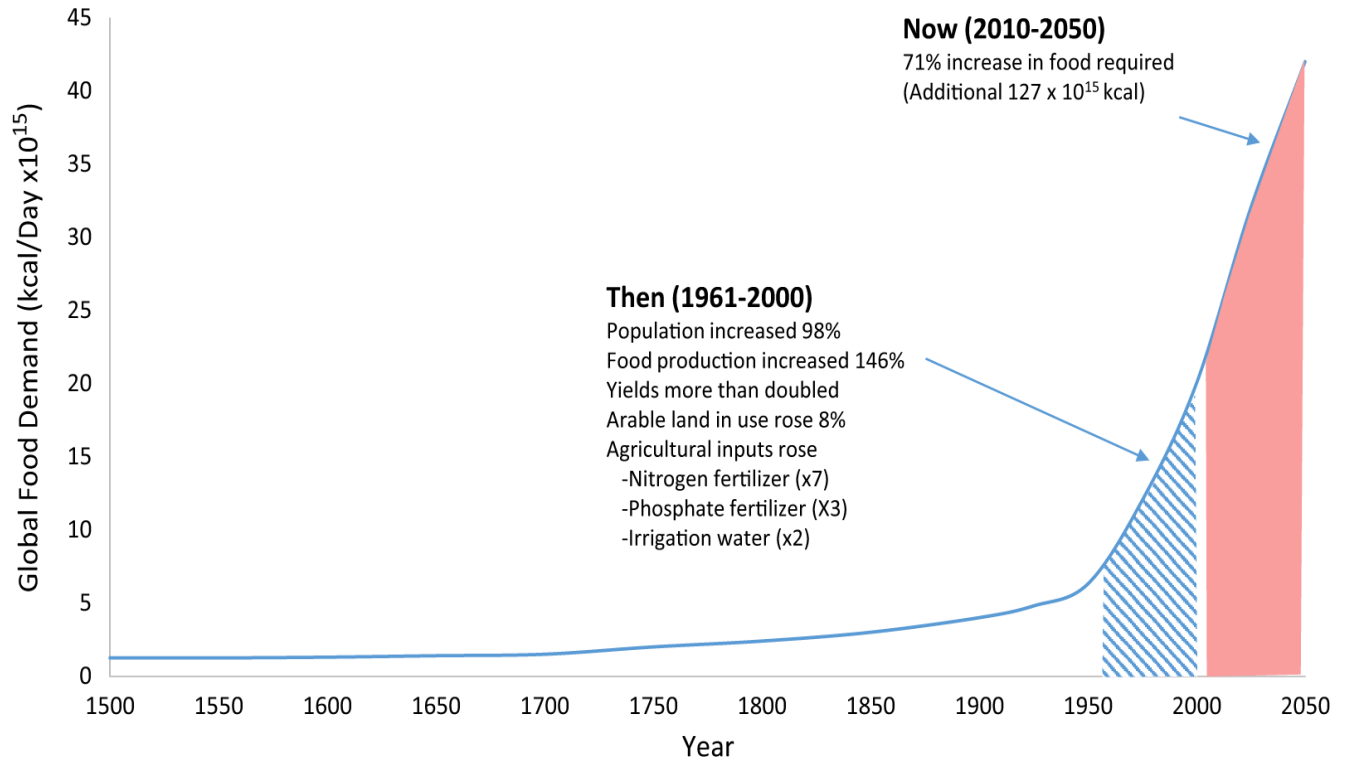
### Facts, Factors affect Food Security Globally

The world currently produces more than **enough food** to feed everyone, yet 815 million people (roughly 11% of the global population) went hungry in 2016, according to the U.N. By **2050**, with the global population expected to reach 9.8 billion, our **food** supplies **will** be under far greater stress. **Here comes the importance of Alternative Foods.**

#### **6 ways to improve global food security**

- 1, Close the yield gap. By 2050, 120 million hectares of natural habitats will be converted to farming in developing countries.
- 2, Use fertilizer more efficiently.
- 3, Raise low water productivity.
- 4, Target food for direct consumption.
- 5, Reduce food waste.
- 6, Production of Alternative foods/Feeds

## Graphical Representation of Global Food Demand Verses Consecutive Year.



The Above represents clearly the need the role of Alternative Food/Feed in the coming Years.

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