

## Chapter 9

# Critical Review About Aquaponics: Non- Boring Sciences as a Base of Competence

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### ABSTRACT

*This chapter is a conceptual platform for the work of a network of regional experimental sites that work out various aspects of the implementation of design and research activities in the study of aquaponics. The chapter contains a description of the experience of creating a new component of the regional education system “Aquaponics in Education”, the construction of the content of education in the educational organization, taking into account the new component; Designing a unified network of interaction between educational organizations of various types for the implementation of the author’s experimental program “The Academy of non – boring Sciences. Aquaponics “. Methodical recommendations on the inclusion of innovative equipment Fish Plant Family Unit and Fish Plant Production in the educational system, the direction of design and research activities of students in the field of aquaponics are proposed.*

### INTRODUCTION

The openness of education to the real social processes taking place in the country, the activation of interrelations with other elements of a holistic system, with the family and the microenvironment as a factor in the socialization of children’s development, the creation of the pedagogy of relations in society becomes one of the promising ways of developing the education system. It will allow to take into account the impulses coming from the external environment, and to correspond to its real needs.

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## ***Critical Review About Aquaponics***

In the modern world, the inhabitants of megacities are increasingly interested in subsistence farming and high-quality food products. However, only those who have suburban areas can afford it. However, in urban conditions, you can only farm with hydroponics.

Currently, the method of combined breeding of fish and plants in a system with recycled water supply without use of soil, called aquaponics, is increasingly popular.

Working on the principle of the ecosystem of fish and plants, such technology is environmentally safe: fish provide nutrition to plants, and plants purify water. In the era of energy conservation and environmental priorities, aquaponics has been developed.

Despite the fact that the aquaponics technology is known all over the world, in Russia only a few farms have mastered it, one of which is in the Astrakhan region. The administration of the Astrakhan region decided to start education in the area of aquaponics through the education system.

## **BACKGROUND**

The first mention of the joint cultivation of fish and plants is in the civilization of the Aztecs, then the ancient Chinese. In the 21st century, this technology is entering a new stage of development.

Traditionally, fish were grown in large ponds, or in mesh paddocks on the ocean coast, but in the past 35 years, significant progress has been made in recirculating aquaculture systems.

Their advantage lies in the fact that fish can be grown much more: up to 1 kg per 7.5 liters of water, thereby using only a portion of the water and space needed to grow the same amount of fish in a pond or net enclosure. In the XX century, along with aquaculture aquaponics began to develop. This is due to the farmers' search for methods of growing fish, which allow reducing the dependence on land, water and other resources.

In the 1970s, Dr. James Rakosi at the University of Virgin Islands began the research on the use of plants as a natural filter.

The first large-scale commercial aquaponics facility, the Bioshellers in Amherst (USA, Massachusetts) was established in the mid-1980s, and is still in operation.

Home aquaponics owes its origin in the early 1990s to Tom and Paul Spuraneo, owners of a marine farm in West Plains (Missouri, USA). They diligently improved the technique of the nutrient layer, which is more suitable for small systems, and compiled a guide with practical recommendations that became the launching pad for many home systems. Leaders in aquaponics became Dutch. In Europe, in Canada, in the United States, the aquaponics see the future. In Japan, they united a garden, a garden and an aquarium. This device is simultaneously for organic farming and for relaxation.

Despite the obvious benefits and advantages of aquaponics in the field of obtaining environmentally friendly products, this way of obtaining quality food has not received proper attention and spread in Russia.

## **MAIN FOCUS IN THE CHAPTER**

### **Issues, Controversies, Problems**

New technologies of production, directions of agriculture with the use of innovative technologies, at the level of the philistine are associated with difficult working conditions (less developed and technically

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