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A SURVEY OF SNAIL FARMING TECHNOLOGY (HELIX ASPERSA MAXIMA) IN PELAGONIA REGION, R. MACEDONIA

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Abstract

Heliciculture, commonly known as snail farming is an activity that has developed in Western Europe and the United States in the last few decades. This paper presents the technology of Helix aspersa maxima snail production in one private farm in Pelagonia region, Republic of Macedonia. The system of the production chain consider the following stages: indoor breeding, outdoor fattening and packaging. The period of the whole production process is from May to October, wherein the average weight of the adult fresh snail is approximately 20-23 g, respectively. The aim of this study was to put an accent on the production technology of snails reared in ecological conditions in our country, the yield and the quality of this product targeted for the European market.

Key words: snails, Helix aspersa maxima, rearing technology, Pelagonia region

1. Introduction

Since past times people considered the snail as a quality food. The snails are consumed and appreciated for their high nutritious value, the high percent of proteins including almost all of the amino acids, iron and other minerals, low content of lipids and cholesterol. All in all it can have a great positive effect on the wellbeing.

In the present times, in most of the western European countries the snail meat and the caviar from snail eggs are considered as a special delicacy. The use of the snail meat in the human diet is drastically lower compared to other kinds of meat. One of the reasons for this is the limited supply of this product in commercial use, as well as the promotion of the snail food as a luxury high priced food. In the last couple of decades the breeding of the snails evolved in order to satisfy the need for diverse and new food on one side and the true economical value on the other side. The global pollution and the destruction of the natural eco-systems is one more reason for breeding snails on farms. Essential to achieving high quality snail meat is great care and a lot of hard labor, as is securing the adequate conditions and the modern stated criteria for breeding on well based holdings or farms.

2. Snail farming technology

The environment in which the snail farms are going to be build should secure the best possible conditions for the breeding of snails that include factors like suitable temperature, air currents, annual atmospheric sediment (rain) and the creating of dew, physics and chemical structure of the land and the accessibility to water for irrigation.

The adjustable land should cover: adequate texture (mixed or loosed soil) with pH value of 5, 8-7, 5, the presence of limestone 1, 5% - 2, 0 %, without planted trees (or big spaces between regularly planted trees), source of water for irrigation and as maximal sun exposure. The adverse properties include: too much muddy or too much sandy soil, highly acid soil, presence of trees (especially irregularly planted) and uneven terrain.

The holding or farm is a well build and fenced space which includes all the necessary conditions for the undisturbed breeding of the snails. The fences represent one of the core elements for the proper production in the open-air farms. The fences are the key to success, they should stop the snail migration, to protect the snails itself from predators and to divide the snails in to the different stages of development (from offspring to matured snails ready for fattening).



Image1. Snail farm with alongside feeders

The fencing of the space should be done with appropriate plastic net (buried in the ground for about 30 cm, to stop the predators from entering) with height at least 60-70 cm, galvanized metal sheets with 0.3-0.4 mm width and concrete or wooden pillars. The inner space should be divided into lanes with spaces between the lanes of 50-100 cm, and planted with low grass. This spaces are essential for the uninterrupted movement of the farmers and making the feeding and harvest much easier. The lanes are planted with vegetation: spinach, Swiss chard, sunflowers, English grass and are equipped with an irrigation system (artificial rain).

The feeders (feeding boards) are being stationed in the lanes (wooden plates with average size dimensions 50x50 centimeters placed under certain angle) and are used to spread the food as well as a protection from the sun, excess of water (muddy soil) and other pests and predators. Snails crawl and stick to the bottom side of the feeders but when the optimal conditions are met (in the mornings when there is dew or at sunset when the water sprinkles are on) they migrate to the top of the feeding boards.

Our farm (LLC Chashitovski) is located in ecological environment in the village of Kukurechani close to the town of Bitola, R.Macedonia, and is consisted of 3 open-air holdings (farms) with the total area of 15 000m², reproductive center, 3 chambers with the necessary conditions for the maintenance of the finished product, and other helpful objects for production of the food for the snails and the storage for other equipment.

The snails we breed in the farm are coming from our own reproductive center. The most resistant and the fully formed mother snails are selected very carefully. The mother snails are placed in appropriately equipped room with good thermal isolation and heating system (heating equipment and air conditioners), irrigation system, particular water dispersion system composed of: water pump, hose pipes from the source and sprinklers, as well good artificial lightening (neon lamps). The entire equipment is essential to provide optimal conditions, namely: a constant temperature of 18-20 degrees Celsius, air humidity of 80%, well illuminated room (18 hours daylight and 6 hours nightlight).

The mother snails are placed in housings-wooden boxes in which they are preparing during 21 days for laying.

During this period they are additionally feed up every day with a special mixture of crushed cereals, sunflower, vitamins and minerals. At this juncture/period occurs the snails' reproduction. Snails are hermaphrodites (possess both male and female reproductive organs), but to get to fertilization is necessary pairing two individuals.

Following the 21 days in the boxes, the fertilized snails are placed in plastic boxes with soil (moist, porous, loose) in which the snails will lay their eggs.

The process of laying eggs lasts 3-4 days, and in this period each mother snail lays about 80-100 eggs, buried in the ground of about 5 cm. When the egg-laying is done, the plastic boxes are removed from the wooden boxes. The eggs are manually extracted from the soil with a spoon in other plastic boxes perforated on the top side. The boxes with eggs are placed in a room for incubation (with the same optimal conditions) on wooden shelves and they are left to mature for 2-3 weeks in order to hatch small snails. These small snails are ready for settlement in the farms.

2.1.The raising of the snails *Helix Aspersa Maxima* on our farm is carried out in the following manner:

On the already constructed farm with all its elements, creating one sustainable eco-system, till the end of March the process of planting the necessary vegetation starts - chard which is planted on the corners of each lane and cabbage which is planted in the middle of each lane. In the begging of April in the already grown vegetation within the lanes, small snails – offspring (20-25 days) are populated in the lanes.



Image 2. Habitation of small snails

Their development lasts till October. In this period the snails feast on the planted vegetation and additional nourishment – special mix from grinded grains mostly corn, sunflower, soy, concentrate with vitamins, potassium carbonate which are necessary for the good development of the snails

body as well as forming a strong and quality shell. This food supplement in the form of powder is being poured daily on the feeding boards in the lanes. Also the required quantity of water is being secured through the systems of irrigation (sprinkles). The process of the growth of the snails is being carefully monitored, active measures are being taken to suppress all the pests and the sick and dead snails are being removed. On the end of October the snails are being gathered manually in suitable fishnet bags that can hold 5kg. During the gathering a classification is being made. First class (snails from 25-35 grams with good calcified helicoid shell), second class (same meat quality but the shell is not calcified around the opening of the shell).

After the conducted inspection, the bags with the snails are being put into special dryers which are open and perforated from the bottom side in order to drain the excess water and remove the excrement as well as all the others debris (leaves, grass, stones etc.) as well as their ventilation.



Image 3. Shelves - dryers perforated on the underside; bag (5 kg) in a plastic crate; snail's membrane in the aperture

During this procedure the so called “starving” of the snails is being performed. In this faze during a reduced impute of nutritious ingredients the snails are being put into hibernation. They dehydrate and create solid membrane from mucus – a kind of operculum on the shaft of the shell. All the vital functions are reduced to a minimum (puls -2 beats per hour, reduced respiration, and the securing of energy is being performed through the reserves that are stored in the liver).

The bags are being carefully turned over in the next few days. When this procedure is done the and the snails are stored in specials chambers which provide adequate temperature and ventilation (they are equipped with fans, air conditioners) and are ready for selling on the market.

Reference

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