Fact sheet
Diversification
(Alternatives) 8

V1 2020

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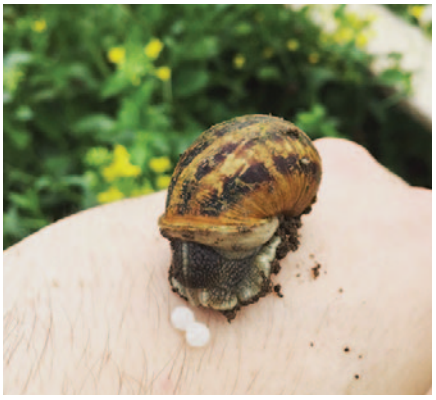
# SNAIL FARMING

## Introduction

Heliciculture, commonly known as snail farming, is the process of raising edible land snails. Snail farming is a niche farming concept, which has evolved here in recent years.
The natural snail observed in Ireland, called *Hélix Aspersa Muller* (also known as Petit Gris), is one of the three most popular species on the market.



*Interest in snail farming has grown recently in Ireland.*

## Establishing a snail farm

Land requirement is minimal, with preferably medium light soil, rich in lime and calcium. Space for growing leafy vegetation or vegetables is necessary for feeding purposes. Night dew is important for healthy snail mobility. Sheds or snail boxes must be secure to avoid snails escaping, and protect against predators.
Also use materials which are decay resistant. The ideal solution is to limit investment costs by converting pre-existing buildings.

## Labour input

Snail farming requires a lot of time and manpower. For example, for a farmer producing 10 tonnes of snail, their work time is estimated at 2,000 hours per year. This does not include processing and commercialisation. The monitoring of humidity levels, temperature and nutrition of the snails are the most time-consuming operations.

## Mortality rate

There is great variability in the mortality rate. The average mortality rate is 20% (from egg to the finishing stage and prior to sale) and it can increase significantly if there is a problem with natural predators such as mice, rats or birds. This is why investing in the initial infrastructure is so important. There are no diseases associated with snails as such; however, there are parasites which can affect snails mainly due to overcrowding, poor hygiene or polluted water.

## Snail harvesting

Harvesting is done by hand and is labour intensive. Snails are then purged, netted and exported. Breeding adults will be selected from the acre and placed in a hibernation room where they will sleep over winter until they woken in January to mate, beginning the cycle once more.

## Breeds

The two species that have the best market potential for breeding are *Hélix aspersa* (Petit Gris) and *Hélix aspersa maxima* (Gros Gris). The adult weight of a small grey snail (*Hélix aspersa*) is 8-15g, while the big grey snail (*Hélix aspersa maxima*) weighs 17-25g.

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# Snail farming techniques

### Extensive system

Snails are farmed in outdoor free-range snail pens. There is no precise feeding requirement and snails are allowed to move around the pasture sourcing food and water. This system is not very productive nor is it a commercially viable.

### Mixed or semi-intensive system

Here the snails are commonly reared on pasture but also spend some time indoors. They are commonly supplemented with nutrients. In this system, egg laying and hatching occurs in a controlled environment. The young snails are then sorted after six to eight weeks and placed in growing pens.

### Intensive

This is the most commercial method of rearing snails. In this system, adequate attention is given to the welfare of the snails. They are kept in a controlled environment where feeding, watering and proper medications are provided.

There are four main stages to a mixed or semi-intensive snail system.

# Production cycle

There are four main stages to snail production:

### Stage 1: (January to March)

Reproduction: start-up snail farmers can skip this bit in the first year if they prefer, making their baptism into snail farming easier, and go directly to the purchase of baby snails. 30,000 breeders are required to populate a one-acre stage four finishing growth stage. The snails mate in a warm temperature of 17°C constant. Additional lighting is required to provide 16 hours of day time and eight hours of night time with the lights out. Snails lay eggs in pots with soil on the breeding tables inside the breeding room. Each snail may lay up to 150 eggs. The ideal humidity is between 75% and 95%. These gastropod molluscs are hermaphrodites. A hermaphrodite is any organism that has male and female reproductive organs and, therefore, can produce both eggs and spermatozoa. After fertilisation, the eggs go through a process of growth inside the snail, until they are ready to be delivered. After that, both snails lay their eggs and bury them in separate places inside a small hole made in topsoil in a cool place.

### Stage 2

Incubation: the eggs are gathered manually using a plastic spoon and placed in the incubation chamber. They are placed in plastic boxes which are kept at 20°C. The eggs will hatch after 15 days.

### Stage 3

Growth room: during this stage the baby snails are kept in a polytunnel, where they get light directly from outside. The optimum night temperature during this stage is 12°C. They will stay here for eight weeks.

### Stage 4: (May to September)

Finishing growth: the snails are moved into the field. Just one acre can accommodate 1.2 million snails and produce 10 tonnes of snail meat. A one-acre plot needs to be laid out with tilted wooden supports, like pallets propped up, which both protect the snails from adverse weather and allow dry food to be placed on top for when they come up to feed at night. Netting covers the entire area and galvanised sheets primed with an electric fence on the border prevent the snails from escaping. The netting also prevents birds and rats from entering to feed on the snails.

### Soil type

The soil type is paramount to success. Snails naturally prefer a damp soil that is neither very wet nor dry. A soil moisture content of 35% is ideal and the land should not be prone to flooding. Damp soils allow the snails to move around freely and to lay their eggs in the soil. Ideally, the soil should have high humus or organic matter levels. Such soils serve as natural sources of nutrients and minerals for the snails. In intensive systems, the soil should be supplemented with lime to aid good shell formation. Soils should be well drained with minimal compaction and well aerated to allow air penetrate the soil easily. .

# Investment and processing

It's necessary to have an isolated and heated building with appropriate lighting. Breeding snails will need to be purchased in a first-time situation. Material for the laying pots and the nursery boxes will also be required. An outside field area is also necessary.
The initial snails will be purchased from other established snail breeding farms or selected among the snails in fattening/finishing if already established. It's also important to anticipate the investments related to the commercialisation: building, vehicle, refrigeration box, incubator, etc.

There are no facilities here in Ireland to process snails and add value. One of the biggest challenges is to establish distribution to the untapped and huge demand on the continent. The big distributors of snails on the continent are not interested in individual farms. Instead, they want to buy in bulk and this is where Irish producers need to focus their business models. The establishment of a centralised producer hub will be necessary to help mobilise and distribute the produce from indigenous Irish snail farmers.

Snail food distributors are looking at added value products. This is something which snail growers should be considering.

The processing premises can be a shared workshop, a rented laboratory, or for bigger producers, it can be an individual processing workshop. It costs between €50,000 and €70,000 for the processing workshop, not including the equipment. The equipment (cold cell, freezer, stainless steel table) costs between €30,000 and €45,000.

**Product categories:**

- living snail (unprofitable);
- pre-cooked snail (scalded, shell off, frozen, preserved in jars); and,
- cooked snail.

## Markets

Before investing in a snail farm, it is recommended that you identify your market. Every Irish palate is not yet ready for the snail market, though there is growing interest. Europe provides an open market for snail producers, and large quantities are imported from Eastern Europe; however, there are concerns regarding the quality of this product. Western European snail farmers are coming under increasing competition from Eastern European countries, such as Poland, with lower costs.

There is also a growing demand in the Middle East and Asia for Irish snails.

Snail meat is very high in protein, low in fat and yet has high reserves of calcium and iron. It also has a very low carbon footprint, making it a very attractive food source for the future.

## Expected revenue

According to industry sources at the time of writing in August 2020, baby snails cost 11c per thousand while mature breeding adults cost between 10c and 15c per animal. Between 25,000 and 30,000 breeders are required to populate an acre. Sales of 10t of snails can achieve approximately €40,000, giving a gross profit of €20,000. These figures are estimates for guidance only and are subject to market trends, which can fluctuate.

## Labelling rules

The labelling of snail products presented in pre-packaged form and destined for the French market requires the following mandatory information:

- the total consumable mass, i.e., the mass of flesh and fillers defined;
- the size designation; and,
- the number of pieces or units contained.

The sales description must include a qualifier describing the physical state, or the specific treatment undergone by the commodity. Slaughter and processing premises must meet the standards in force according to the type of marketing.

## The state of snail farming in Ireland

Demand is much lower here than in France and there are about 20 snail farmers in the country. Some of the experienced snail farmers offer courses for would-be snail farmers, and these are regularly taken up. *Hélix aspersa* (the Petit Gris) are kept in polytunnels to supply local hotels, restaurants and delicatessens with snails in various gastronomic forms. A French example of a snail unit producing 200,000 snails or two tonnes of snails (small greys) on 1,000m$^2$, and carrying out the diversification (with laboratory rental) is shown in **Table 1**. This will give an idea about assessing costs for Irish snail unit developments. Source: French Chamber of Agriculture.

*Second fattening stage.*

# 08: Snail Farming

## Example data on snail breeding.

Source: French Chamber of Agriculture

**6,400 breeders** (age: four to six months)
Reproduction from January to May

20-60% mortality

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**5,120 breeders**
Fertility rate: 80 to 150 eggs per laying. Incubation period: 10 to 25 days depending on the temperature

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Reproductive performance:
50 to 60 young aged of one day per laying

**365,000 young hatched**

5-25% mortality during nursery (period of one to four weeks)

↓

**320,000 young in outside areas**

5-15% mortality during the fattening
35% mortality in outside areas

↓

**200,000 snails**
(Early October)

Animal feed in a flour form (corn, wheat, barley, soybeans):
1.1-2kg of compound feed to get 1kg of snail.

## Farming conditions for mixed breeding.

Hibernation

Temperature: 5-7°C
Humidity: 75-95%
Lighting: 18 hours of light and six hours of darkness

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Reproduction

Temperature: 20°C
Humidity: 75 to 95%
Lighting: 18 hours of light and six hours of darkness

8,000 breeders/30m$^2$

↓

Nursery

Temperature: 20°C
Humidity: 75-95%
Lighting: 18 hours of light and six hours of darkness

80 to 150 eggs/snail
1 box for 40 breeders

↓

Growth

April to September
Temperature: natural conditions
Humidity: natural conditions and irrigation
Lighting: natural conditions

40 snails/m$^2$

*FIGURE 1: A breeding example and conditions for breeding.*

## Table 1: Investment costs.

| | |
|---|---|
| (Livestock feed) 6,200kg x €0.26 | €1,612 |
| Fertilisers, seeds | €396 |
| Packaging/boxes | €838 |
| Fuels, lubricants | €595 |
| Other raw materials | €2,286 |
| Purchase of animals (laying) | €3,050 |
| Water, gas, electricity, maintenance | €1,067 |
| Maintenance repair | €381 |
| Insurance premium | €1,220 |
| Remuneration of intermediaries* | €6,658 |
| Travel and transportation | €2,590 |
| Laboratory rental** | €3,201 |
| Marketing/publicity | €1,524 |
| Taxes, levies, similar payments | €3,536 |
| Depreciation and amortisation | €3,810 |
| **Total expenditure** | **€32,764** |
| Sale of products (The sale of products varies from €0.14 to €0.46 per snail according to the preparation and the circuits of marketing.) | €42,940 |
| **Margin after remuneration of employees** | **€10,176** |

**Processing workforce: two persons x 336 hours x €9.91/hour. **(42 days x € 76.21).*
*The margin can vary from one year to another depending on weather conditions and the management skills of the breeder. As a result, production returns remain uncertain.*

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## Further information

For further information please contact Barry Caslin,
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The following resources are also helpful:
www.ildn.ie
www.localenterprise.ie/Find-Your-Local-Enterprise-Office/

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