

Snail Farming



Mariska Leeftang

Januari 2005

AgroBrief-Series No 3

Snail Farming in tropical areas



Woman opening snail-cage

Snail farming can be very successful in areas where the local market for snails is strong. Snails are very nutritious, high protein foodstuff and cultivating them seems very easy. Snail farming is very popular in West Africa (especially Nigeria), South America and some Asian regions (Vietnam). It is even so popular that people don't think about adverse effects any more.

Furthermore, snail farming can prevent snails from being endangered in areas where snails are captured in the wild. And snails fit very well in other (agricultural) activities:

- Snails can help to fertilize the soil;
- snails that can't be sold (because they are too small, for example) can be fed to a pig; shells can be fed to chickens;
- snails can be used as live bait for fishing;
- handcraft stores may be interested in the shells.

But sometimes, snail farming fails and snail farmers see themselves forced to quit the snail breeding. One of the reasons for this are snail diseases, but more often the snails are getting out of control: in some cases the snails escaped and in these regions they are now the biggest pest there is for gardeners and farmers.

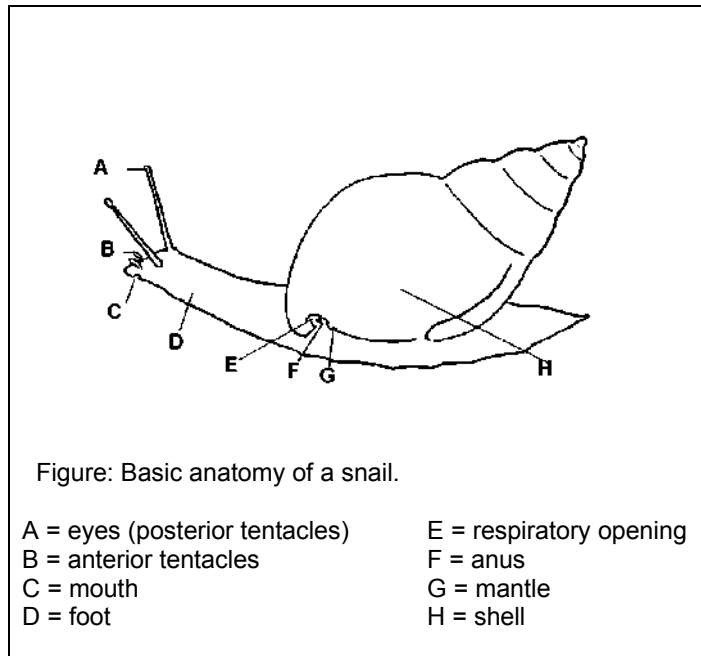
In this article, I will give some practical advice on how to start a snail farm. I will give instructions on how to manage it, in order to prevent problems as much as possible. At the end, a list will be presented with contact addresses and further readings.

How to get started?

If you want to start a snail farm follow the next procedure.

- plan
 - market
 - production
 - organization
- pilot production and sales, go / no go decision
- invest in facilities and knowledge
- scale up
 - logistical control
 - quality control
 - financial control

Only step one and two (plan and pilot) will be considered in this article.



Plan regarding market

Plan by finding your answers to general questions.

Why do you want to farm snails?

Do you want to sell them or eat them yourself, sell them live at the local market or will you preserve them and sell on a distant market, is there a possibility to can them or sell as frozen meat? Is it a touristy area? Can you sell the snails to restaurants?

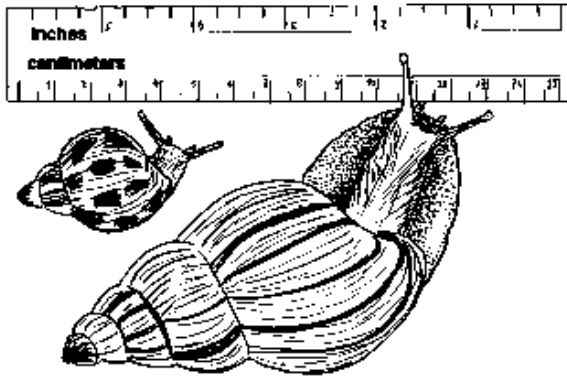
Plan regarding production

What type of farming do you want to do?

The first division that can be made is between *part life cycle farming*, in which the snail are collected from the wild and held in paddocks to improve health and quality, and *complete life cycle farming*, in which the snail are bred on the farm. The latter is the most recommended. A point of caution has to be made here. Part life cycle farming must be discouraged, because collecting snails from the wild will lead eventually to the extinction of snails in the area. Furthermore, if you have farm-bred snails, these may be susceptible for diseases the wild snails take with them to the farm.

Another division that can be made is based on the size of the farm: is it just for own use, or do you want to sell the snails to larger companies. The size of your farm, the number of snails to start with and often the type of housing is based on this question.

Which species do you want to farm?



There are several land snails that can be farmed and eaten. Examples are *Helix aspersa* and *Helix pommatia*, these are kept in Europe. Snail species that are suitable for tropical areas are the giant African snails, *Achatina fulica* and *Achatina achatina* (bodyweight between 80 and 250 g) and the big black snail *Archachatina marginata* (bodyweight about 350 g). In the figure you see both types.

Where do you get my snails from?

Where can I buy snail for reproduction? Do I collect them from the bush (not recommended) or is it possible to buy them on the local market?

How many snails to start with?

In a project of IDRC in Nigeria, it was found that optimum stocking density was 100 snails/m² for juveniles weighing 0.5-49 g, and 30 snails /m² for pre-adult snails weighing 50-100 g. A 100-g table-sized giant African snail was achieved in approximately 16 months.

Plan regarding organization

Snail farming is best fitted in your daily life and people you know already. If you divide the life cycle of the snails over different producers you can scale up the production and reduce costs of a kg of snail meat. One person breeds and selects parent stock and several other persons receive young snails and grow them to market weight.

Organize the timing of the production so you have a finished product in large quantities or at fixed intervals. Logistics, quality control and financial organization are indispensable for an income generating enterprise, not so much for households.

Pilot production

During a pilot production you keep records of everything you do and of characteristics of the snails in order to make a judgement later. Only then you will get started safely.

Housing

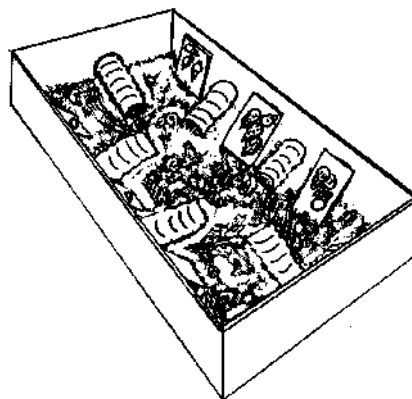
The best way to keep snails is in a kind of terrarium (glass cube with lid that can be lifted) or other small artificial environments in which temperature, humidity and light intensity can be regulated. But plastic tunnels are also a good choice. The most important factors in housing are humidity and protection against wild animals, birds and thieves.

Furthermore, the soil quality is an important factor for growth. Also an alkalic and moist, not wet soil is required. Keeping them outside in the garden is not recommended. The snails are then easy preys for birds and so and the chance of escaping is too big. In the past, it happened very often that escaped snails became a pest for the farmers in the neighborhood.

Snaileries can vary from a patch of fence-protected ground, sheltered from the wind, to a wooden box or movable pen. Also widely used are trenches or pits which, provided your snails are protected from predators (rats, lizards, centipedes). Wood ash, neem or tobacco leaves help to deter natural predators and a site close to the home helps to deter human thieves.

Snails need plants to feed on and shelter plants. Humidity is essential at all times and snaileries must be watered when ambient humidity drops. Make sure the air in the box is humid by regularly supplying wet litter or a wet cloth. Prevent humidity to drop below 65%. You may need a cover to the box in the dry season.

In the figure you see a box containing snails on litter. In the box objects are placed to give them shelter and comfort, like halves of plastic bottles and trays put against the side.



Feed

Snails are often fed with plants that can also function as protection. Examples are rape, African spinach, horseradish, papaya, banana and loofah. It seems that snails change their eating preferences as they age, the younger snails preferring leaves whereas the more mature enjoy fruit. Giant African Snails are apparently unwilling to tackle the skin of fruit or vegetables, which the grower must therefore slice or quarter in order to avoid excessive waste. A source of calcium is also important for shell formation. Ordinary school chalk works well but is expensive. Powdered oyster shells or poultry eggshells can be used as readily available sources of natural calcium.

More information on local feed can be obtained from a booklet 'Snail rearing' (see More Info).

Stock

Breeding stock can be obtained from a nearby market or collected from the bush. In either case, this at least ensures that the species is adapted to local conditions. In other cases you import stock. What to do to keep them healthy?

But snails are not without problems, especially when exotic species are introduced, whether for farming or as 'agricultural pest'. Most vulnerable are the hatchlings which, in the case of *A.achatina*, are tiny. This species may lay a clutch of several hundred eggs of about 5mm in length and the newly emerged snails are about the same length. In the case of *A.marginata*, there are fewer, larger eggs of about 1cm in length and the hatchlings have a better survival rate being more robust. Again, as with any livestock, management that is sensitive to the particular needs of the species, together with standard good practices of hygiene and protection, should ensure a reasonable success rate.

Health and disease

Traumatic shock: The growing shell is very fragile and, if damaged, the animal's growth pattern is upset. The shell itself is protected by a membrane or cuticle and this does not regrow if removed by abrasion. The exposed shell is then vulnerable to attack by anything acidic.

Infectious diseases: Roundworms (*Nymhelix bakeri*), larvae of insects, fungi and bacteria are the most common infectious diseases, but only little is known about infectious diseases and their therapies in snails.

Trauma: Snails, especially young snails, are very vulnerable to shell damage. Especially if their shell is already thin because of feed- or health problems. Therefore: be careful in handling snails!

Poisoning: Most common causes of poisoning are herbicides (used by farmers to kill unwanted herbs) and pesticides (used by farmers to kill unwanted pest animals or insects). Poisoned snails are not longer able to eat and they die. They are not edible either, as the poison accumulates in their body.

Humidity: If the air is too dry, snails dry out and die. This can be prevented by sprinkling water over the soil. If the air is too humid, fungous diseases occur. Diseases, not so easily cured. Humidity should be 80% to 90%. Or 70% during day and 90% during night. Humidity higher than 95% may be harmful, just as humidity below 65% will be.

Temperature: Low temperatures are not harmful, but some snail go hibernating if it is cold. They have a very long sleep then, that is useless for the snail farmer.

Feed: Chalk (calcium) is important for the strength of the shell. You could keep records of living weight or total length of the snails, to see if they are growing well.

Crowding: snails are vulnerable to overpopulation. Crowding: snails are vulnerable to overpopulation. It is difficult to say what the maximum population density is. Overcrowding may in general cause decrease in number of eggs produced, low weight gains and deaths due to build-up of slime on the ground. Lower stocking rates produce larger snails in a shorter time. For African snails, density stocks of about 100 juveniles or 30 pre-adult snails per square meter are recommended. But if you want to breed them yourself, a lower population density (e.g. 6-7 per m²) will be required. For the smaller European snails (e.g. *Helix Aspersa*), stocking densities of 25 snails per square meter for breeding and about 300 for fattening are mentioned.

As with any livestock, mini or macro, it is easy to slip on the trail to success. West Africa is home to several edible snails, but the most popular are the giant snail (*Achatina achatina*) and the big black (*Archachatina marginata*). The former reaches a bodyweight of between 80 and 250g in 18 months to two years, whereas the big black adult weighs about 350g or more. The two are far larger than the European, *Helix* species. Even the best-fed snails may fail to grow well.

Snails fit in well with other farming activities, helping to fertilize the soil prior to cultivation of other crops. And those of unmarketable size can be fed to a pig, shells included.

More information:

- An internet site of a Brazilian snail keeper. Lists the items which you should think of when you plan to start a snail farm. <http://www.escargot.com.br/eng/comercio.html>.
- The Canadian Ministry of Agriculture, Food and Fisheries of British Columbia has published a report on snail farming. "Farm Structures FactSheet: Heliculture. Culture of edible snails." January 1994. Order no. 770.000-1. Address:
Ministry of Agriculture, Food and Fisheries of British Columbia
Resource management branch, Canada,
1767 Angus Campbell Road, Abbotsford,
BC, Canada V3G 2M3.
- Report Australian Snail Farming, ISBN 0 642 58703 5; Via:
<http://www.rirdc.gov.au/reports/NAP/03-137.pdf> or e-mail: snails@netwit.net.au.
- Document by The New Agriculturist on gastronomic gastropods: <http://www.new-agri.co.uk/99-3/focuson/focuson3.html>.
- Reference Brief of the Alternative Farming Systems Information Center. Raising Snails, by Rebecca Thompson and Sheldon Cheney.
http://www.nal.usda.gov/afsic/AFSIC_pubs/srb96-05.htm#Pens
- Akinbile Stephen 2000, "Snail rearing", pp 16 Erodise publication productions, P.O.Box 231 Ikire, Osun State, Nigeria, erodise@yahoo.com

Agromisa, P.O. Box 41
6700 AA Wageningen
The Netherlands

Email: agromisa@agromisa.org
Website: www.agromisa.org
Fax: +31 317 419178