



Division of Livestock Sciences

# MIXED FARMING

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Laying hens in organic apple orchards

#### An Apple hen Handbook for organic farmers

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 862357.

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### Apple Hen IDEA

Specialization and professionalization are also necessary in Austria's mostly still small-scale agriculture.

But why shouldn't highly specialised permanent crop areas also be used as a good habitat by extensively kept animals? This Apple hen Handbook aims to motivate you that the combination of fruit/wine and animals can go well together in practice.

If we want to continue to offer more seasonal, regional, ecologically valuable and animal-friendly food in the future, we have to make optimal use of the enormous potential of our agricultural land. Permanent crop areas such as apple orchards / meadow orchards or vineyards can provide an ideal habitat for certain farm animals. A positive example in every respect is the "Apple hens".

In 2019, five Demeter apple farmers, in collaboration with the Research Institute of Organic Agriculture FiBL AT in coordination with the "von Herzen Biobauern GmbH" to find practical and economic solutions for this development. In three trial years they tested and optimised the keeping of spent laying hens in mobile small-scale housing directly in the orchards.





With the EU project MIXED (Multi-actor and transdisciplinary development of efficient and resilient MIXED farming and agroforestry systems; <u>https://projects.au.dk/</u><u>mixed/</u>), the University of Natural Resources and Applied Life Sciences Vienna has been scientifically supporting pioneer farmers in the expansion of this special type of combination of fruit production and animal husbandry over several years since 2022.

This Apple hen Handbook is intended to motivate you, dear farmer, to also seriously consider which farm animals best "suit you". Additional work and also necessary initial investments are one thing, the daily joy of the pecking chickens under the trees or the new, direct contact with egg customers are another.

This Apple hen Handbook, made possible by the EU project MIXED, financed by the EU program Horizon 2020, will help you with the practical implementation.



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# Apple hen **PRINCIPLES**

Organic orchards have been managed more and more professionally in recent years.

With the specialization that is often necessary for this, however, the organic approach of the mixed farm and the holistic system has been lost more and more. Apple hens live in mobile small houses in extensive free-range husbandry directly in the orchards.



#### Increase biodiversity

The aim is to revive the specialised permanent crop areas by keeping laying hens. The aim is to revitalize the specialised permanent crop areas through the keeping of laying hens. Permanent crop areas represent an ideal habitat for species-appropriate, extensive poultry keeping due to the abundant natural feed supply, especially during the vegetation period, as well as the cover provided by trees/shrubs and, if necessary, by hail protection nets.

#### Organic areas

The apple grouse areas are managed in accordance with the legal requirements of the EU Organic Farming Regulation 2018/848 as amended.

The areas are subject to organic control.

#### Small mobile stables

Apple hens are kept in free-range systems with mobile small stables including outdoor areas in accordance with the legal requirements of EU Organic Farming Regulation 2018/848 as amended. A maximum of 120 laying hens are kept per stable, in total less than 350 animals.

#### Post-use or pedigree hens

Apple hens are post-use animals, from own breeding or pedigree hens. Organic young hens may make up to 20% of the Apple hen.

# Generous green outdoor run for use in animal nutrition

Each Apple hen has access to a permanent vegetated area of at least 100 m<sup>2</sup> around the mobile stable. Especially during the vegetation period, the hens can cover a considerable proportion of their need for essential amino acids through their natural feeding behavior. A positive side-effect: keeping hens directly in the orchard is the most natural way of is the most natural way of est pressure, especially from the apple sawfly and codling moth.

#### Performance-oriented fodder

The feed complies with the legal requirements of the EU Organic Farming Regulation (EU-Bio-VO 2018/848 i.d.F.) and ensures that the hens are fed in a way that is appropriate to their performance and the animals.

#### Direct marketing of eggs

The eggs of the Apple hens are used for self-supply and unsorted sale directly to end consumers. The keeping of Apple hens is non-commercial and is therefore not subject to point 3.1.1 of the AMA QSGap restrictions. Ongoing risk assessment and specific risk management are carried out on a voluntary basis.

#### Phase-out in times of epidemics

In the event of a regionally imposed ban on free-range husbandry, the area and air space under the mobile barn can be used as an "emergency run". This must be secured in such a way that no contact with wild birds or their excrement can take place.

# Apple hen MANAGEMENT

Keeping Apple hens can be a great enrichment for the whole farm. It is important to think through which activities are involved and who is responsible for them before the hens are brought in.

Even if there are seasonal peaks in the quantity of eggs, animal husbandry is a responsible year-round task that can often be taken on by the older or younger generation on the farm.

Children and young people in particular enjoy working with chickens and the sale of eggs provides their first income.

#### Activities in the stable

Depending on the housing system, the stable must be cleaned regularly, the litter changed and the droppings removed. The feed trough and drinkers must be checked daily (preferably when the eggs are removed) for function and cleanliness. Adequate feed must be provided.

# Animal health and welfare of the Apple hens

The health of the animals and the welfare of the Apple hens must be checked daily, when the eggs are collected and when the animals are observed during various tasks in the orchard. A good indicator for the health of the animals is a beautiful plumage of the Apple hens. If the hens separate from the flock, this is often a sign that they are unwell

### Marketing of the eggs

The eggs of the Apple hens are used for self-supply and unsorted sale directly to end consumers. Under this condition, keeping laying hens in small groups is neither subject to registration nor does a packing center have to be registered.

#### Regulatory Compliance

The applicable legal requirements in the event of a regional outbreak of avian influenza (bird flu, avian pest) must be complied with; <u>https://www.verbrauchergesundheit.gv.at/tiere/krankheiten/ai.html</u> The area and the air space under the mobile stable can be used as an "emergency run" in times of a pandemic. This area must be secured with mesh fencing to prevent contact with wild birds or their excreta.



#### Apple hen stable

The stables shall be mobile and shall be erected directly in the permanent crops in such a way that they do not affect the building and spatial planning regulations. However, it must be decided on a case-by-case basis whether a whether a small mobile stable is a building as defined by the building and regional planning law or a vehicle within the meaning of motor vehicle law.

If it is a vehicle, the municipality does not have to be notified or informed.

## Apple hen **ORIGINS**

The main characteristic of the Apple hens is that they are animals that can cope well with extensive husbandry. The basic idea is therefore to give priority to post-use animals (hens after the first laying period) whose requirements are better suited to extensive management, but which still have a good laying performance.



In principle, it is advisable to always obtain animals from the same farm in order to keep the hygiene status as high as possible and also to avoid unnecessary rank fights.

The following origins are possible:

#### Old hens

Post-use animals, so-called "old hens", which come from an organic laying hen farm with good flock management after a first laying period.



#### Pedigree hens

Pedigree hens (e.g. old breeds) are an interesting alternative that creates enthusiasm especially because of the eggs with different shell colours.

#### Own offspring

Establishing your own offspring requires some effort and must be well thought out. The advantage is that you can selectively breed from those breeds that cope particularly well with extensive Apple hen husbandry.



#### Junghennenzukauf

Indicative value for the purchase of pullets to ensure a continuous market supply and to supplement the flock: up to 20 % of the Apple hen flock.





### Apple hen HUSBANDRY

Apple hens live in species-appropriate micro-animal husbandry in particularly extensive organic free-range husbandry. The mobile Apple hen stable for max. 120 birds is located directly in the orchard or vineyard. The paths to the well-vegetated permanent crop areas (min. 100 m2 per hen) are short. According to the marketing standards, specific risk management measures have to be taken into account, if necessary.



#### • Mobile small stables

Apple hens are kept in free-range systems in mobile small sheds including an outdoor scratching area in accordance with the legal requirements of the EU Organic Farming Regulation 2018/848 as amended. A maximum of 120 laying hens are kept per stable, and a maximum of 6 birds per m2 of usable shed area.

In total, less than 350 Apple hens are kept on the farm. The small Apple hen stables shall be mobile and shall be erected directly in the permanent crop areas in such a way that the provisions of building and spatial planning law do not take effect.

#### Winter-suitable design

For the well-being of the hens and to maintain a consistent laying performance, it is important to provide a suitable house climate in winter as well as in summer. Therefore, the house must be equipped with sufficient thermal insulation.

#### Protection from predators

One challenge of mobile laying hen husbandry is losses due to predators. Foxes, for example, can be kept out well by an electric fence at a height of about 20 cm. However, it is best to find an individual solution together with those responsible for hunting.

#### Lighting and stable climate

The window area is at least 3 % of the barn floor area. The light day (natural light and artificial light) should last 13-16 hours. The installation of an automatic light switch makes sense. White energysaving lamps with 5-8 watts or LED lights are suitable for lighting



#### Generous green outdoor run

Each Apple hen has unrestricted access to a permanent vegetated area of at least 100 m2 around the mobile hen house during the day. The outdoor scratching area corresponds to the minimum house area, is graveled/surfaced and is best located directly under the mobile house. If the authorities impose a temporary ban on free-range husbandry, the outdoor scratching area must be secured by means of mesh gates in such a way that no contact with wild birds or their excrement can take place.

For detailed information on housing structures for laying hens, see ÖKL leaflet no. 36 **"Kleine Ställe für Legehennen – Freiland und Bodenhaltung"** <u>https://oekl.at/publikationen/merkblaetter/mb36/</u>



#### MINIMUM REQUIREMENTS (DIMENSIONS)

| Criterion Organic  |       |  |  |
|--|-------|--|--|
| Stable area, max. animals/m <sup>2</sup> acc. to EU-VO 2018/848  | 6     |  |  |
| Outdoor area, free-range Austria min. m <sup>2</sup> /animal acc. to<br>EU Regulation 2018/848                                 | 10    |  |  |
| Criterion Organic Apple hen  |       |  |  |
| Outdoor area, in orchard/scattered fruit min. m <sup>2</sup> /t.   | 100   |  |  |
| Outdoor coulter room/conservatory gravelled and disease-proof directly under the mobile small hutch, max. birds/m <sup>2</sup> | 6     |  |  |
| Rooster/hen (target)   | 2/100 |  |  |

# DIMENSIONS OF MOBILE LAYING HEN STABLES (OWN CONSTRUCTION)

| Number of animals | Dimensions     | Material   |
|-------------------|----------------|--|
| 12                | 1,25 x 2 x 2 m | 3-layer natural wood panels in spruce<br>dimensions: 5 x 2,05 m / 5 x 1,25 m |
| 25                | 2,5 x 2 x 2 m  |  |
| 40                | 4 x 2 x 2 m    |  |
| 50                | 5 x 2 x 2 m    |  |



### **STABLE EQUIPMENT**

|                            | Requirement  |   |  |
|----------------------------|--|---|--|
| Manure box                 | max. 2/3 of the barn area; min. 450 cm <sup>2</sup> /animal (possible source of manure grids: <u>https://www.faie.at/tierhaltung/tierhaltung/gefluegelhaltung/zubehoer-gefluegelhaltung/5098314/kunststoffrost-fuer-gefluegelhaltung</u> )                     |   |  |
| Scratching area            | at least 33 % of the usable area; with litter, e.g. straw and shavings mixture, husk mixture, etc.   |   |  |
| Perches Length             | Length: min. 20 cm/animal<br>Distance: at least 20 cm to the wall<br>at least 30 cm between perches<br>at least 35 cm to the droppings grid<br>The upper edges of the perches must be slightly rounded.  |   |  |
| Laying nest                | Single nest: Max. 7 hens/nest (only 5 hens/nest recommended for small houses); recommended dimensions: Height 35 cm, width 25-30 cm, depth 35-40 cm  |   |  |
|                            | <b>Gruppennest:</b> recommended dimensions: minimum area 1500 cm <sup>2</sup> ; per hen min. 120 cm <sup>2</sup>   |   |  |
| Feeding                    | Long trough:<br>At least 10 cm/hen   | For small flocks, feed containers to be<br>filled manually above the droppings box or<br>in the scratching area (e.g. https://www.                            |  |
|                            | Round trough:<br>At least 4 cm/hen   | weidezaun.info/olba-gefluegel-futterauto-<br>mat-verzinkt-mit-plastikdeckel-40kg.html)  |  |
| Drinker                    | Channel:<br>At least 2,5 cm/hen  | Round and bowl drinkers should be<br>approx. 25 cm above the stable floor for<br>hygienic reasons; drinking water must<br>always be available, even in winter |  |
|                            | Round drinkers:<br>At least 1,5 cm/hen   |   |  |
| Opening to the outdoor run | At least 35 x 40 cm (height x width) (e.g. light switch with chi-<br>cken flap: <u>https://jost-technik.de/PHB2AE-RB-als-Rahmengeraet-</u><br><u>mit-selbstverriegeInder-BIO-Klappe-und-Lichtsteuerung-getrenn-</u><br><u>te-Antriebseinheit529_102.html</u> ) |   |  |

Source: ÖKL Merkblatt 36, FIBL

## Apple hen **FEEDING**

Even in extensive Apple hen husbandry, feeding that is appropriate for the animals and their performance is an important part of ensuring the hens' well-being and performance.

In the rows of the orchard, the hens find valuable feed in the form of plant parts and insects, earthworms, etc., yet supplementary feeding of "complete feed" is important to achieve laying performance and product quality (e.g. egg shell) without compromising animal welfare. For example, hens deprive their own bones of calcium for the formation of the egg shell, which must be compensated for by sufficient calcium supplementation.



#### Basic principles

- The feed must always comply with the legal requirements of the EU Organic Regulation No. 2018/848 as amended.
- In the sense of "feed no food" (avoidance of food competition), at least 35 % by weight of by-products from organic food production are recommended in relation to the annual ration.

#### Specifics of digestion

- Hens do not have teeth and therefore need so-called stomach stones as a grinding aid in the gizzard when feeding coarse feed such as whole grains, as this is where the mechanical comminution of the food takes place. This is why grit is a fixed component of the ration.
- The short intestine is the main site of digestion, the caecum is mainly used to digest the crude fibre.
- The feed intake capacity is therefore limited.
- The ingested feed passes quickly through the digestive tract.
- The raw fibre digestion provides only little energy for the hens
- Highly digestible, highly concentrated feeds must therefore be used



#### Feed intake

- Hens see and feel (with their beaks) very well and are therefore very selective.
- Yellow and red feed components are preferred, green, blue and black particles are not so readily eaten
  - Prefer hard grains to floury feed
  - The components in the feed should be between 0.5-2 mm, 1.4 mm are preferred and should make up the largest proportion.

Hens prefer wheat and (broken) maize to the other cereals.



# **SPECIAL FEEDING** of the Apple hens

"Apple hens" are primarily old hens. These hens come from organic layer farms that cull their birds after one laying period. The laying performance of these hens is still around 80 %, i.e. their requirements for the supply of energy, protein and above all methionine are no longer so high and they are very well suited to extensive Apple hen farming.

Nevertheless, old hens are also high-yielding animals and feeding (complete feed) must not be neglected. In order to be able to lay many eggs "unda-maged", the hens need a good supply of feed



# Important factors and guidelines for feeding old hens

- Feed requirement of old hens is between 110 130 g feed/hen/day, only when there is a very good feed supply in the orchards do they manage with significantly less additional feed.
- At least 10.7 MJ convertible energy/ kg feed mixture
- A good protein supply (amino acids), especially 0,30 – 0,35% methionine in the feed
- For the formation of the eggshell, 3.5 % calcium in the feed is essential, this is offered in the form of grit
- Provision of fresh water in suitable drinkers

 Old hens have lower feeding requirements with a still good laying performance

Methionine is a very important amino acid for hens. Sufficient calcium ensures good eggshell stability and bone health.

These values refer to complete feeds for old hens (Feeding strategies on the next page) and exclusively indoor husbandry. In Apple hen husbandry with

structured run, good plant cover and insects, these values can also be undercut and need not worry the farmers, as long as the animals are active and healthy and lay sufficient eggs of good quality.

**Please note:** If, for example, there are more young hens in the flock due to their own offspring, the ration must be adapted to their needs.

The color of the yolk also depends on the feeding method. Eggs from organic farming are characterized by a rich yellow yolk due to the feeding method and free-range farming.



# Examples for **APPLE HEN FEEDING**

The Apple hens have access to large outdoor areas in the orchards, which are also used for foraging. This means that a certain part of the nutrient and energy requirement is already covered by the natural forage in the run during the summer half-year, although this is difficult to quantify; this reduces the amount of complete feed required and lowers the feed costs.

#### • An extensive summer feed mixture can be offered as complete feed

Especially in the cold months there is no usable vegetation and insects available. It is therefore necessary to provide the henswith sufficient feed during this period. There are basically the following possible strategies for this.

#### • A more intensive winter feed mixture can be offered as a complete feed



#### There are basically the following possible strategies for this:

#### Complete feed

This is purchased from feed manufacturers or dealers, e.g. as bagged goods.

The advantage of this is that these mixtures already contain all the ingredients to ensure a sufficient supply of nutrients. The working time required by the farmers therefore only consists of feeding the hens.

The cost of the complete feed can be a disadvantage.

It is important to always keep an eye on the hens - the feathering and egg quality (laying performance and quality) indicate whether the feeding needs to be adjusted

#### Own mixtures

For this purpose, feed components are produced in-house or purchased depending on availability and mixed on the farm itself.

The advantage of own mixtures can be a lower price.

The disadvantage is the amount of work involved and it requires knowledge of the ingredients.

Possible options are e.g:

- Simple variant from a mixture of cereals, premixed protein supplements (incl. vitamins and minerals) and grit from the specialist trade.
- Variant consisting of protein various cakes (pumpkin seed, sunflower, soya, linseed cake), pea, soya bean, field bean, lupine) and energy feed (cereals, maize, mill-products, vegetable fats), purchase of vitamin and mineral supplements

According to the motto **"If the hen is doing well, we are all doing well"**: Have fun keeping "Apple hens"!

## Explanations MIXED FARMING SYSTEMS

This handbook was developed within the framework of the EU project MIXEDers. In MIXED, the climate, environmental and social benefits of mixed farming and agroforestry systems (MiFAS) are being researched in order to promote the further development of such systems.

The assumption is that MiFAS have improved efficiency and resilience compared to conventional farming systems, while providing ecosystem services to society.

The project is based on networks of organic and conventional farmers who have different knowledge and experience. MIXED wants to enable farmers to learn from each other, and researchers to learn from and with farmers, in order to create new knowledge together.

The project will work with these farmers and other stakeholders to develop networks across Europe. These cover a wide range of mixed farming and agroforestry systems and enable the exchange of knowledge and experience. In addition, valuable scientific knowledge regarding methods and production systems is gained through the cooperation of researchers and farmers. Research is conducted on how to improve the implementation of MiFAS in Europe and which policy measures can support this development. MiFAS come in many forms and dimensions. They can occur within a field, within a farm, between farms or even at landscape and value chain levels. The concept aims to optimise the use of resources through collaboration and/or diversified production (crops, trees, livestock), where different productions benefit from each other. For example, the combination of crops, grassland and bush/tree cover can provide food and shelter for animals, while the fields are fertilized with the dung of the animals. This can improve carbon sequest-ration and increase biodiversity. Diversified production can also increase the resilience of farms and bring them closer to a circular economy.

Therefore, MiFAS can be a possible alternative to monocultural farming systems.

In Austria, compared to other EU countries, land is often still small-scale. Agriculture is in the hands of small family farms. But even these are increasingly highly specialised, with only one branch of operation. If we want to offer more seasonal, regional and ecologically valuable food in the future, we have to make optimal use of the potential of these areas. A positive example are the "Apple hens": permanent crop areas such as apple orchards provide an ideal habitat for farm animals. Highly specialised orchards neither meet consumer expectations nor are they a place of diverse habitats. Specialisation and professionalisation are important steps towards sustainable food production. But it will be even more important to manage the land ecologically, to keep the animals well and to set up the farm in a sustainable way.

With the support of the MIXED project, we were able to give mobile laying hen husbandry in apple orchards a broad media stage. The hens in the organic orchard show the innovative power of organic farming.





Link to the project website: https://projects.au.dk/mixed



#### Imprint

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The project was initiated by the pioneer farmers: Werner and Elisabeth Paar, Fritz Prem, Johann and Irene Trummer, Martin Wagner, Martin and Edith Weberhofer.

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