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agroscope

Agroscope good food, healthy environment

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Agroscope

The potential of microalgae is enormous, which is why Agroscope is researching the options for using these microorganisms as ingredients in livestock feed (see article on topic, pages 6–7).

Dear readers,

Agroscope research without innovative laboratory methods and analytics is unthinkable. Researchers develop new safety and quality methods in animal and human nutrition, perform residual analyses, diagnose plant pathogens and test the authenticity of cheeses. Agroscope has decades of experience in these fields.

Agroscope also maintains collections of microorganisms: fungi that can attack insects such as cockchafers or Japanese beetles, bacteria for producing cheese cultures, but equally bacteria that can infect humans, honeybees or crops. These collections assist with the further optimisation of diagnostics and analytics, enabling the rapid identification of the respective pathogen. Read more about this topic on page 6 in the article 'Agroscope's Microorganism Collections – an Invisible Treasure'.

In addition to conducting conventional laboratory research Agroscope also works with cutting-edge techniques, as shown by the 'Alpine and Mountain Farming' Experimental Station article 'Drones Benefit Summer Farming'. Modelling in general is increasingly being used in agriculture: in an interview Samuel Wüst describes how a tool called PreDiMIX is being developed to help optimise cereal mixtures, since research shows that genetically heterogeneous fields may be less susceptible to pathogens.

Innovations are also emerging in other spheres, however. Read the article on page 10 ('Fodder Trees: a Supplementary Forage Resource for Livestock') for an insight into how the ruminant diet is being optimised. That's only a fraction of what plants can do, though, as evidenced by the piece on page 18 ('Targeted Greening to Control Trackside Vegetation').

On page 20, 'The Salt Dilemma with Emmentaler Cheese' explains why the most famous Swiss cheese with holes contains so little sodium, and thus represents an exception in the world of cheese.

Lastly, we hazard a peek into the future: On page 22, Agroscope researchers look at Swiss demographic trends in the piece 'Swiss Agriculture is Ageing – What Does This Mean for the Future?'.

Wishing you an interesting read,
Corinne Jud Khan

Head of the 'Methods Development and Analytics' Competence Division /
Head of Agroscope as of 1 March 2026

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Agroscope is the Swiss Centre of Excellence for Agricultural Research, and is affiliated with the Federal Office for Agriculture (FOAG). Agroscope makes an important contribution to a sustainable agriculture and food sector as well as to an intact environment, thereby contributing to an improved quality of life.

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4 – 5 November 2025
Grangeneuve-Fribourg
Joint Conference with ALB-CH, AGRIDEA and suissemelio

Rural Construction Training Course for Construction Specialists

18 November 2025, Agroscope Tänikon

48th Agroscope Agricultural Economics Conference

27 November 2025
Agroscope Tänikon

6th Food Sector Innovation Forum

27 November 2025
Agroscope Liebefeld Campus

Agroscope Liebefeld Milk Conference

22 January 2026
Agroscope Reckenholz and online

13th Agroscope Sustainability Conference

All Agroscope events that are open to the public are advertised on our website.

Drones Benefit Summer Farming

Drones can save time when looking for livestock or checking the condition of fences on summer pastures. Researchers at Agroscope have studied the factors that influence the use of drones in summer farming.

Maximilian Meyer, Linda Reissig, Katja Heitkämper

Drones are used in many sectors today, including agriculture, infrastructure monitoring and civil protection. They can also hep reduce the workload in summer farming. Here, they are mainly used for monitoring livestock, checking fences and assessing damage after wolf attacks. Agroscope researchers have investigated which factors influence the take-up of this technology in a study conducted in the context of the 'Alpine and Mountain Farming' Experimental Station.

Drones are helpful when summer farmers reach their limits

Analysis of farm census data shows that drones are mainly used on farms with high livestock numbers, complex field topography and permanent shepherding. In other words, drones are used to monitor areas that those working in the mountains cannot easily access, without entirely replacing humans. Protected areas are an impediment, as drones are not permitted to fly in these zones without an exemption permit, if at all.

Use of drones involves numerous stakeholders

The decision to use drones is not taken in isolation, but involves numerous stakeholders working together to provide resources, financial support, or advice and policy guidance. For their part, drone users such as summer farmers and shepherds provide feedback which contributes to the take-up of the technology. Successful implementation thus depends not only on the decision at individual farm level, but also on inter-farm and structural framework conditions.

Decision depends on degree of open-mindedness

The decision to use drones is influenced by factors such as openness to new technologies and willingness to acquire new knowledge. Although financial support is limited, targeted investment in simple, affordable drones can reduce the workload. Drones will not revolutionise summer farming, but can be meaningfully integrated into existing structures, provided that they are adapted to the

Drones are used in Swiss summer farming inter alia to monitor livestock and fences and to assess damage after a wolf attack.

specific conditions and personalities on the ground. Although this sounds like a strong incentive for the extensive use of drones, at present their use remains limited.

Future of summer farming: need for research, training and legal framework for the use of drones

Drone use could increase in future, especially when farms are taken over by younger generations. Further research to determine the timing and associated cost savings is needed to assess the potentially far-reaching implications of using drones on summer farms. In addition, targeted training events and legal clarity could support the spread of drones and help safeguard the future of summer farming. —

Conclusions

- Drones can save time and complement traditional working methods without entirely replacing humans.
- In summer farming, drones are mainly used for monitoring livestock, checking fences and assessing damage after wolf attacks.
- The decision for or against the use of drones depends on various factors: both external, such as legislation, power supply and funding, and internal, such as openness to new technologies and willingness to learn on the part of summer farmers.

'Alpine and Mountain Farming' Experimental Station

Scientific publication:
Agroscope Science, 207, 2025, 1–20.

Agroscope's Microorganism Collections – an Invisible Treasure

Agroscope harbours a treasure in the form of its microorganism collections. From fungi to cheese-culture bacteria by way of microalgae, these valuable resources drive research on behalf of a more sustainable agricultural sector.

Katia Gindro, Florian Freimoser, Alexandra Baumeyer, Benjamin Dainat, Noam Shani

Microorganisms are key players in all sorts of ecosystems, which is why they play a pivotal role in many of Agroscope's research areas. In agriculture, for example, they are essential for soil quality as well as crop health and productivity. Besides this, they are actively used in processes such as composting, biogas production and even biological pest control. Microorganisms are used in the food industry to manufacture products we consume every day, such as yoghurt, cheese, wine, beer, kimchi and chocolate.

Agroscope microorganism collections contain algae, bacteria, viruses and fungi.

Fungi, algae & co.: Agroscope's microorganisms collections

Over the course of decades of research, Agroscope has set up various collections comprising a wide range of microorganisms from different environments. To give a few examples:

- The Mycology Group at Agroscope maintains a living library: *Mycoscope*. This collection comprising over 5200 fungal strains enables the study of pathogen epidemiology, the monitoring of emerging resistances, the analysis of complex fungal communities and the discovery of new natural compounds. It also provides an essential foundation for developing biological strategies to control plant diseases.
- The 'AlgoScope' microalgae collection is of recent provenance, established in 2022 as part of the 'Algafeed' project which aims to develop suitable indigenous microalgae as an alternative animal-feed protein source to soya. The most promising strains of the collection are used to develop food- and feedstuffs, and could in future be used in research into applications in fields such as bioremediation, biofuels, natural biocides and even plant growth aids.
- A collection of microorganisms from fermented foods was also created at Agroscope within the context of research on the microorganisms in milk and dairy products. The collection mainly contains bacteria isolated from fermented dairy products. In addition, it encompasses isolates from other fermented foods (such as meat or fermented plant products), a collection of bacteriophages and wine yeasts, and reference strains from international collections. The strains of this collection are used in a wide range of research applications. In addition, the cheese cultures underlying the success of many Swiss cheese dairies contain isolates from this collection.

An important resource for current and future research

The above-mentioned examples are just a selection of the comprehensive resources maintained by Agroscope. Equally worthy of mention are the collection of entomopathogenic fungi for research into biological pest control and the collections of honey bee- and human pathogenic bacteria, including antibiotic-resistant strains. Likewise of great interest are the collections of fungi, viruses and bacteria that can affect crops as plant-disease pathogens. Lastly, Agroscope also has a collection of soil microorganisms serving as a valuable resource for research into soil health and soil biodiversity.

Agroscope recognised early on the value of such collections for research activities and supported the extensive work associated therewith, particularly through the interlinking of the collections to promote scientific cooperation. The interactive database of the fungi collection (www.mycoscope.ch) makes it easier for researchers to make use of these valuable resources.

These collections offer the scientific research community unique access to microbial biodiversity, which – just like the biodiversity of the animal and plant kingdoms – is under threat from changes to the environment. They are not only a precious legacy of the diversity of Switzerland's microorganisms but also a resource of inestimable value for current and future research, and hence for the development of new products and applications.

In the latest issue of its magazine, Agroscope invites you on a tour of its microorganism collections, which harbour a veritable treasure trove of invisible biodiversity. —

Scientific publication:
Agroscope Transfer, 579, 2025, 1–14.

Dual Relationship with Two Fungi Makes Trees Fitter

Several tree species form a symbiotic relationship with two different groups of mycorrhizal fungi at the same time. These trees cope better when water and nutrients are in short supply.

How Healthy are Milk Alternatives? Analysis and Scope for Improvement

An Agroscope study has analysed the nutritional quality of 66 milk alternatives from Swiss supermarkets. The researchers also considered how the nutritional profile of milk alternatives could be improved.

The DOC Trial – a Two-Generation Comparison of How Organic and Conventional Flourish

Launched in 1978 in Therwil, Canton of Basel-Country, the DOC Trial has supplied fundamental findings described in numerous international specialist publications over its 47-year existence.

Biodiversity in the Agricultural Landscape: Lessons from Ten Years of Monitoring

Agroscope has monitored the biodiversity of the Swiss agricultural landscape since 2015. Taken as a whole, the situation has not changed over this period. Individual improvements can be observed in the ecological focus areas in particular.

Novel Cheese-Ripening Process also Works with Vegan Cheese Alternatives

Agroscope has been granted a patent for an innovative method for surface-ripening vegan foods. Originally developed for traditional cheese varieties, this method now facilitates the ripening of plant alternatives which have previously proven resistant to traditional ripening owing to their susceptible surfaces.

Automatic Milking in PDO Cheese Sectors: Between Tradition and Technology

A new study looks at the impacts of automatic milking systems on milk quality, its link to terroir, microbial biodiversity, social aspects and the image of PDO cheese.

Agroscope Working on Breeding a Cultivable Variety of Arnica

Since 2021, Agroscope has been working on breeding a variety of Arnica montana suitable for cultivation in Switzerland. The aim is to preserve the natural populations that are decimated by collection of the wild plants.

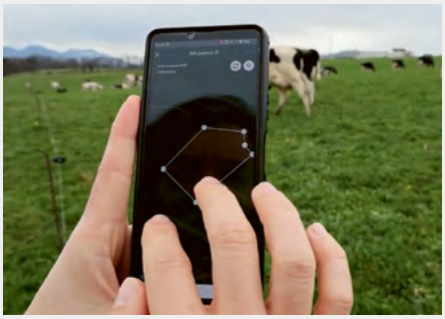
Cotton Bollworm Moving Northwards

The cotton bollworm is a major pest in vegetable crops. This tropical migrant butterfly has made it as far as northern Europe due to climate change. Population numbers have currently reached their peak. Agroscope monitors the insects and identifies countermeasures.

Sustainable Food in our Towns and Cities

Swiss towns and cities are hosting numerous innovative food projects – from community gardens, to bulk-food shops, to foodsharing. The TASTE Project highlights particularly successful food initiatives.

→ Video



Smart Farming: Acceptance among the General Public and Farmers

The Swiss general public rates the use of digital tools and technologies more positively in plant- than in animal production. Acceptance of future digital technologies among farmers depends not only on how open the farmers are to digitalisation, but also primarily on concrete, farm-specific risk-benefit assessments.

Alleviating Heat Stress in Dairy Cows

Cows develop heat stress much more quickly than humans. Agroscope has studied this physical stress and offers advice for its alleviation.

→ Video

→ Further news topics

Fodder Trees: a Supplementary Forage Resource for Livestock

Summer droughts reduce grassland yields and forage quality. More drought-resistant than herbaceous species, certain trees can provide supplementary forage of good nutritional value in summer.

Sébastien Galland, Alice Dind, Nathaniel Schmid, Geoffrey Mesbahi, Sébastien Dubois, Massimiliano Probo, Pierre Mariotte

Increasingly intense summer droughts have led to a sharp decline in the yields and nutritional value of grassland forages. Producing sufficient supplies of quality forage has therefore become a genuine challenge for farmers. It is in this context that agroforestry could serve as an additional source of forage for ruminants, particularly during periods of summer drought.

Agroforestry for forage production refers to the use of fodder trees as a forage resource for livestock. The animals consume the leaves and young twigs, either directly from the tree or from previously pruned branches. Although fodder trees have been identified as an alternative source of forage since the very beginnings of agriculture, no data on the yield and nutritional value of tree leaves in Switzerland have been published to date. It was therefore essential to evaluate the forage potential of trees within the Swiss pedoclimatic context in order to provide support to livestock farmers in the management of trees and hedges grown for forage.

Fodder trees can produce additional forage for feeding livestock, particularly during summer drought periods.

Conclusions

- Fodder trees supply additional forage of high nutritional value in summer.
- Branch diameter is a good indicator of forage availability for planning feeding with pruned tree branches: branches with a diameter of 5 cm can produce between 250 and 600 g DM according to the tree species.
- White willow, goat willow, common ash and sycamore are the species with the highest yields of leaves per branch and a high nitrogen content.
- Twigs can be an important source of zinc, copper and calcium, although their nutritional value is fairly poor.

A study of seven common tree species in Switzerland was conducted on six farms participating in the Federal Office of Agriculture-funded Agro4estrie resource project (2022–2026). The forage potential of the seven tree species was evaluated in terms of leaf yield and nutritional value.

Fodder trees provide a useful forage supplement

The results show that branch diameter is a good indicator of branch forage availability for livestock feed planning. Branches with a diameter of 5 cm can produce between 250 and 600 g dry matter (DM) according to the tree species. Thus, six to seven 5-cm-diameter branches of common ash or white willow could provide 20 % of the daily dry-matter ration of a dairy cow in the form of tree leaves, without counting the consumption of that year's young twigs.

The nutritional value of fodder-tree leaves is better than or equivalent to that of grass-based forage

The leaves of white willow, goat willow, common ash and sycamore are characterised by a high nitrogen and low fibre content and provide a better-quality forage than grass-based forage in summer. By and large, the trees' young twigs have very high levels of fibre, and hence low levels of digestibility; however, they also contain high levels of copper, calcium and zinc, which could help prevent mineral deficiencies in the animals.

Scientific publication:
Swiss Agricultural Research 16, 66-72, 2025

Variety Mixtures for Healthier, more Yield-Stable Wheat Crops

Crop variety mixtures can yield various agronomic benefits. For many years now, Switzerland has been developing and testing winter-wheat mixtures in real-world conditions. Despite this, both the area under cultivation and the market remain relatively small. In an international collaborative project, Agroscope researcher Samuel Wüst is working on compiling new basic knowledge and developing predictive models to create particularly high-yielding mixtures.

Are variety mixtures competition for breeding?

Breeding is still one of the main tools for improving production. At some point, however, there is a limit to what the individual variety can deliver. This is where mixtures can come into play. But we still need to learn more about how to create added value. Hence, the launch of the 'PreDiMIX – Predicting and Understanding Diversity Benefits of Variety Mixtures' Project.

What is the focus of the new project?

The project focuses inter alia on increasing yields and yield stability, as well as on disease suppression. On the one hand, we aim to gain a more fundamental understanding of positive mixing effects; on the other, we aim to develop predictive models that will enable the benefits of mixtures to be further increased.

What is the main advantage of variety mixtures?

Often there are various benefits for practitioners, e. g. a certain protection against unforeseen events such as drought stress. What's more, increased genetic variety in the wheat field helps prevent the spread of diseases, reduce plant-protection product use and thus also achieve reduction-path targets.

What exactly makes variety mixtures higher-yielding than individual varieties?

Variety mixtures are higher-yielding if the individual varieties differ in terms of their demands on the environment, or vary in terms of how susceptible they are to abiotic or biotic stress factors. Here, an important aspect is that plants in the field are in strong competition for resources – competition that can be reduced through differing requirements. Alternatively, one variety can make up for shortfalls in the other variety by making use of the resources that become available.

Samuel Wüst works on developing predictive models to create particularly high-yielding variety mixtures for wheat production.

Why are predictive models needed?

Mixtures do not automatically offer added value. By studying the traits and genetics of the 'pure' varieties, we hope to predict the stand-out combinations that will provide clear advantages.

Who all are involved in the project?

Six research groups from two countries and four institutions are involved in this interdisciplinary project: Agroscope, ETH, the University of Zurich (all in Switzerland) as well as IPK Gatersleben (in Germany). The project will run for three years, and is funded by the Swiss National Science Foundation (SNSF) and the German Research Community (DFG).

Impressions of current applied-research projects
for the agriculture and food sector.

1 Wheat harvest for the Seed Bank.
2 Combined strawberry production and photovoltaics.
3 The ‘cow toilet’ helps reduce ammonia emissions.

Archive image: Use of the plough

1


2


3


4

5

6

1 Sampling cherry blossom.
2 Testing piglet feed.
3 Grapevine seedlings.
4 Dendrometers optimise fruit-tree irrigation.
5 Grafting the new vines.
6 Labelling the wheat samples.

Targeted greening can keep undesirable trackside vegetation at bay.

Targeted Greening to Control Trackside Vegetation

To reduce the use of herbicides for controlling trackside vegetation, the Swiss Federal Railways (SBB) tasked Agroscope and HEPIA with developing a low-growing plant mix for the track area.

Markus van der Meer, Patrice Prunier, Julie Steffen, Laurent Huber, Fabienne Mörch, Pierre-André Frossard, Serge Buholzer

The Swiss Federal Railways (SBB) have decided to restrict the use of chemical synthetic herbicides to an absolute minimum and promote alternative measures in line with the 'Alternatives to Herbicides' Action Plan. One important consideration was that these measures should neither reduce the service life of rail infrastructure nor jeopardise train safety or accessibility.

'Sowing instead of controlling'

The SBB tasked Agroscope, the Geneva School of Landscape, Engineering and Architecture (HEPIA) and other partners with investigating whether the targeted greening of verges, maintenance and escape paths and trackside areas could be an alternative to the widespread use of herbicides. The aim was to establish a vegetation cover that supressed problem plants, maintained the safety of rail infrastructure and promoted biodiversity. At the same time, the spread of problem weed species to adjacent farmland was to be avoided through careful species selection.

Five specially developed seed mixes were tested at six sites on the Swiss Plateau. The mixes comprised species that were expected to meet safety requirements (accessibility on foot, low growth, shallow roots, no trip hazards, no restriction of signal visibility, no impediment to track drainage) as well as environmental requirements (ecotypes of native plant species).

Site and mix determine success

The long-term trial showed that successful greening of trackside areas can be achieved using selected species: the seed mixes meet the safety criteria, species diversity increases, soil temperature decreases, and trackside landscape quality improves.

Two site factors are key to the establishment of the sown plants:

1. Organic-matter content (which takes a number of years to accumulate on the existing, very poor gravelly soils)
2. An adequate water supply in the sowing year to enable the mixes to establish a seed bank in the substrate.

Two mixes, one covering a broad ecological spectrum and the other containing several pioneer species, achieved an average soil cover of over 70 % after five trial years on a suitable soil substrate.

The proportion of sown species in the overall vegetation cover was significantly higher than that of spontaneous species at all sites during the trial period. Invasive native and non-native species were significantly scarcer than sown and unproblematic spontaneous species. The sowings increased species richness within the plant community by five species on average.

The study concluded that trackside greening is a realistic alternative to the use of herbicides. However, it will do little to reduce trackside maintenance, since targeted greening also demands regular upkeep. For instance, problematic scrambling and trailing plants from adjacent plots, such as ivy or brambles, still need to be controlled, as do tall plants and invasive non-native species.

Future approaches could involve a combination of mechanical, chemical and biological strategies to ensure optimal sustainability. —

Scientific publication:
Agroscope Science, 204, 2025, 1–98

Conclusions

- Agroscope and partners were tasked by the Swiss Federal Railways (SBB) with investigating whether undesirable plants growing along railway tracks could be controlled by targeted greening.
- The plant mixes tested meet the criteria for operational safety if the sown plants are able to establish successfully.
- Targeted greening inhibits trackside colonisation by invasive alien species, thereby reducing the spread of problematic species to neighbouring arable land and grassland.
- Two plant mixes proved successful: one which adapts flexibly to different site conditions and can thus be used in many locations, and another containing several pioneer species.
- Apart from the composition of the plant mixes, site factors are key: adequate rainfall in the sowing year is crucial, and organic matter should be added to the soil to aid establishment.
- Targeted trackside greening offers a realistic alternative to the use of herbicides, but requires regular maintenance to control undesirable plants.

The Salt Dilemma with Emmentaler Cheese

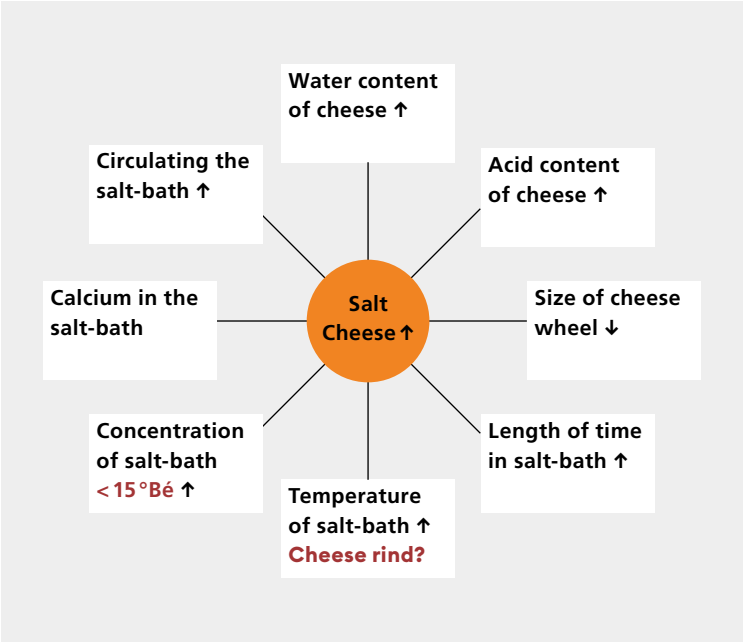
Emmentaler PDO has a low-to-very-low salt content compared to other varieties of cheese. Agroscope researchers show how this came about, what sort of effects this has on sensory quality, and what can be done about this.

Marie-Therese Fröhlich-Wyder, Dominik Guggisberg, Thomas Aeschlimann, Walter Bisig

Cheese salt content is closely associated with the sensory quality, ripening potential and food safety of the final product. Emmentaler PDO as well as other Emmentaler-type hard cheeses differ substantially from other cheese varieties in one aspect: they are often dry-ripened, and have a low-to-very-low salt content. Nowadays this low salt content is increasingly called into question as it has been proven to affect taste and flavour, and hence also the popularity of Emmentaler PDO.

This was not always the case. Over recent decades the NaCl content of Swiss Emmentaler PDO has fallen steadily, due to two major changes:

1. Labour-intensive dry-salting was abandoned from the 1970s onwards.
2. The 1990s onwards saw a rising awareness of low-sodium foods. The lower NaCl content in Emmentaler had the side-effect of making the cheese texture more supple. Furthermore, the introduction of a facultative heterofermentative lactobacillus culture rendered NaCl obsolete for controlling secondary fermentation.



Factors influencing cheese salt uptake, corrected according to the findings of this study (image authors: Walter Bisig & Marie-Therese Fröhlich-Wyder)

In a model trial conducted at Agroscope's research cheese dairy in Liebefeld, different salt-bath treatments were investigated with the aim of describing their influence on salt uptake: NaCl concentration (15 and 21 °Bé), temper-

ature (11 and 16 °C) and duration in salt-bath (24 and 72 h). These factors and combinations of them were tested with model Emmentaler and 'Dolce'-type model cheese (scalding temperature, 52 °C; final stirring and moulding temperature, 49 °C; Agroscope Transfer | No. 551/2024) using the propionic-acid-bacteria experimental culture Prop 23. A variant in which the cheese surface was dry-salted was also examined.

Different salt-bath treatments can control salt content

A lower salt-bath concentration of 15 °Bé produced the benefit of a lower water loss without altering NaCl content. A longer salt-bath treatment (72 rather than 24 h) and dry-salting significantly increased the NaCl content of the cheese. High salt content in the cheese is associated with lower water content, altered ripening processes and altered propionic acid fermentation. In addition, it was shown that propionic acid fermentation requires a minimum NaCl content, in particular to keep the ratio of propionic to acetic acid optimally high in favour of propionic acid. This optimal NaCl content of around 9–11 g/kg (0.9–1.1 %) is far above the current average NaCl content of Emmentaler PDO of 3.5 g/kg (0.35 %). This also applies for a salt content of > 8 g/kg, an essential minimum for a cheese not to be rated as insipid. Even if the NaCl content were increased within this optimal range Emmentaler PDO would still be considered a low-sodium food, and would thus still meet the aims of the Swiss Confederation's salt strategy.

The low salt content of Emmentaler PDO affects the taste and flavour, and hence also the popularity of the cheese.

Conclusions

- Practical relevance: For the implementation of a higher salt content in practice, the following recommendations should be followed:
- Salt bath: Leave temperature at 11 °C, extend length of time in salt bath, reduce concentration to 15 °Bé.
- Dry-salting: Only recommended for storage in humid conditions.
- Manufacturing process: possibly lower scalding and moulding temperatures, intensify acidification.
- Exercise care with pilot experiments: pay attention to differences in cheese dimensions.

A higher salt content will alter product characteristics

A higher salt content also has implications for eye formation and organoleptic properties, however. More salt means fewer off-flavours such as bitterness, and a significantly more intense flavour. The characteristics of the curd are altered towards greater firmness which, in the case of excessive firmness, as occurs with dry-salting, negatively affects eye formation and edge thickness. The benefits outweigh the drawbacks, however: more and purer taste, a more intense flavour and less acetic acid, coupled with increased popularity. In future it will be important for practitioners to place due focus on the changes in curd consistency. —

Scientific publication:
Agroscope Science, 203, 2025, 1–25

Swiss Agriculture is Ageing – What Does This Mean for the Future?

Farm managers are getting older and older on average. Although this trend poses challenges for the Swiss agricultural sector, it also offers opportunities.

Alexander Zorn

Over the next five years in Switzerland, around 7,000 farm managers will reach the upper age limit of 65 for drawing direct payments. This corresponds to 17 % of all family farms. The large number of impending farm handovers or exits can stimulate structural change, offering both challenges and opportunities.

This study examined demographic trends in the Swiss agricultural sector in greater depth. For this, various aspects were analysed: farmers' age at farm handover; the age of new and exiting farmers; and the entry and exit rates for family farms. The study is based on direct-payment data from the years 2004 to 2020.

Many farmers are due to retire in the coming years.

Farms are handed over at a later age

One key finding is that the rising average age of farm managers is due primarily to the fact that they are handing over or giving up their farms at a later and later age. In addition to this, a growing share of the managers of family farms are giving up farming whilst the share of new entrants is falling. A further peculiarity is that the farm is often transferred to someone just a few years younger, presumably the manager's female partner. These trends all contribute to the ageing phenomenon.

The mountain region has the youngest farm managers

The ageing is evident in the ratio of older to younger farm managers. This key figure increased sharply from 2004 to 2020. Whereas in 2004 there were 1.8 older farm managers between the ages of 56 to 65 for every farm manager under the age of 35, by 2020 the ratio had increased to 2.7. There are differences between regions and farm types in Switzerland in this regard. The mountain region has the youngest farm managers, whilst 'arable crops' and 'special crops' farms have the oldest farm managers. This also explains the high average age of farmers in the plain region, where these types of farms are common.

Opportunity for farm growth and transformation

With increasing competition for labour and farm successors, agriculture must be and remain an attractive option. Digitalisation offers agriculture opportunities for boosting work productivity, and can simultaneously increase the sector's appeal to skilled labour and potential farm successors. The land of exiting farmers offers existing farms opportunities for growth. Younger farm managers more often participate in environmental and animal welfare programmes. Agricultural policy-makers could make use of this fact to give targeted support to farms in the process of handover to ensure a sustainable transformation.

The findings are relevant for shaping agricultural policy in Switzerland. They point to the current opportunity to make targeted use of generational change in agriculture to support the transition to a more sustainable agriculture and food system via measures such as extension and funding programmes. —

Conclusions

- Societal ageing can also be seen in the agricultural sector, with the ratio of old to young farm managers rising sharply in recent years.
- Demographic trends vary between different regions and farm types.
- Numerous farm handovers and exits are due to occur over the next few years. This dynamic provides the sector with opportunities to adapt to changing market, environmental and societal circumstances.
- Farm handovers should be planned well in advance. Extension and funding programmes can support the transition process, thereby contributing to the transformation of the farming sector.

Scientific Publication:
Journal of Rural Studies, Volume 115, 2025

We do research for practitioners, but also with practitioners, providing a forum for our partner farms.

Olivier Comby, Saxon (Canton of Valais)

"I wanted to test new ways to aim for zero residue on fruit crops"

For several years now, orchardist Olivier Comby has taken part in the ArboPhytoRed research project which aims to reduce plant-protection product use by 30%. On his apple, pear and apricot plots, Comby is committed to replacing herbicides with mechanical weeding and substituting post-flowering fungicide and insecticide treatments with alternative products. "I was already involved in initiatives to reduce residues. What motivated me to join the ArboPhytoRed project was a desire to test new ways to aim for zero residue on fruit crops", he explains.

Knowledge exchange with the 15 other producers taking part in the project and the scientific monitoring conducted by Agroscope have also convinced him: "Economic assessments show what is and is not achievable in practice."

Karin and Kurt Hangarter, Yens (Canton of Vaud)

"We didn't know enough to strike out on our own"

Farmers Karin and Kurt Bühler-Hangarter combine the rearing of Dexter beef cattle with their herd of dairy cows. Aware of the issues associated with climate change, they are collaborating with Agroscope in the AgroForageTree project to develop an agroforestry system suitable for cattle.
In 2021, they planted ten forage hedges on a parcel of land in order to provide a supplementary forage resource. With these, they hope to supplement the grass ration by around 20%. "Our involvement in a scientific research project means that we benefit from support and regular exchanges with the other participants", they report.
Over a four-year period and on seven farms located in French-speaking Switzerland, Agroscope and its partners will study the growth of the trees, their yields, forage quality and palatability for the livestock as well as the impact of the hedges on biodiversity. —

You'll find these testimonies in full as well as others on our site.

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“Agroscope researchers develop new safety and quality methods in animal and human nutrition, perform residual analyses, diagnose plant pathogens and test the authenticity of cheeses.”

Corinne Jud Khan
Head of the ‘Methods Development and Analytics’ Competence Division /
Head of Agroscope as of 1 March 2026

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