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Agroscope

New cheese ripening method

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Swiss cheeses are often smear-ripened





Starting point

- In Switzerland, more than 90% of cheeses are now pre-packaged and sold over the self-service counter.
- In smear-ripened cheeses, the aerobic smear microflora dies in the pre-packaging. The cheeses begin to stick and a defective off-flavour develops.
- Today's solution:
 - The cheeses are washed before pre-packaging. This is very laborious and very unpleasant work.
 - And the cheeses lose their visual distinguishing feature (the orange-brown rind). After washing, the cheeses look like foil-ripened industrial cheeses.
- Consequence: Many cheese makers prepack without prior washing and accept - due to a lack of alternatives - that their cheese loses massively in quality.





Smear ripening

- The cheeses are regularly rubbed with a mixture of water, salt and, in some cases, cultures of microorganisms. The mechanical care prevents the spread of mold.
- Very widespread in Switzerland especially in hard and semi-hard cheeses: Le Gruyère AOP, Appenzeller[®], Tilsiter, Le Raclette du Valais AOP, Raclette, Tête de Moine AOP, Vacherin fribourgeois AOP, Vacherin Mont-d'Or AOP
- Pros
 - Typical flavour and texture (Degradation of lactic acid by microflora of the smear)
 - Important differences between cheese dairies
 - Orang-brown cheese rind as a visual recognition feature
- Cons
 - Very labor-intensive (manual) or capital-intensive (robotic)
 - In the pre-packaging, the aerobic microflora of the smear dies: off-flavor, sticky



New cheese ripening method

- Registered at the European Patent Office
- Procedure:
 - The cheeses are packed in a biodegradable sleeve after the salt bath.
 - The microflora of the smear subsequently grows on the sleeve.
 - At the end of ripening, the sleeve can be easily removed. A small part of the microflora remains on the cheese, thus preserving the typical orange-brown rind.
- Advantages:
 - Less weight loss during maturing
 - Softer texture and more intense aroma
 - Less effort in cheese care
 - Significantly less quality loss during pre-packaging
- The demands in terms of cheesemaking expertise and cheese-cellar microclimate remain high, which is a good thing.







Agroscope's new cheese ripening method passes initial tests

Agroscope has developed a new cheese-ripening method and filed a patent application for it. Initial trials conducted by its implementation partners are encouraging.

The new cheese-ripening method submitted by Agroscope to the European Patent Office provides for the packaging of the cheeses in a biodegradable sleeve once they emerge from their salt bath. The microflora on the surface of the cheese then develops on the sleeve, which can simply be removed after ripening. A small portion of the microflora remains on the cheese, thus preserving its brownish-orange rind.



Unpacking a raclette cheese from its biodegradable sleeve in the cellar of the Kässnacht Village cheese dairy. (photograph: Agroscope)

Agroscope is working with 13 partners from the cheese sector and two from the textile sector to put the new method into practice. The first trial was conducted with a wide variety of different hard and semi-hard cheeses.

Initial positive results

Feedback from the participating cheese dairies was generally positive. In many of the dairies, the novel ripening process worked well from the get-go. As the complexity of smear-ripening might have led us to expect, adaptations to the local conditions must still be made in a number of the dairies. One important discovery from Agroscope's research dairy in Liebefeld has already been confirmed: the sleeve reduces water loss during ripening, leading to a softer texture and a more intense flavour.

Josef Werder, from the Kässnacht village cheese dairy, was pleasantly surprised by the attractive appearance of the cheeses when removed from the packaging. "Their attractive light-brown colour is particularly appealing," he commented. Urs Schellenberg, from E. Schellenberg Textildruck AG, is delighted that cross-sector partnerships are leading to new areas of use for textile products, thus giving rise to innovative applications. "These types of projects with local partners strengthen Switzerland as a production site." Some cheese dairies also wish to pursue innovations with this novel cheese-ripening method.

Specialist know-how a 'must'

"We are very happy that our method also works under practical conditions. The demands in terms of cheesemaking expertise and cheese-cellar microclimate remain high, which is a good thing. Now we must continue to optimise and to harness innovative potential to the fullest," explains Hans-Peter Bachmann, Scientific Project Manager at Agroscope and co-inventor of the new method. The application was filed with the European Patent Office a year ago. The Patent Office research report was positive, and it is hoped that a first European patent will soon follow. The subsequent filing of a PCT request aims to extend the scope of protection. The PCT (Patent Cooperation Treaty), an international treaty of cooperation in the field of patents, provides for an international patent application having the same effect as in a national



The new cheese-ripening method is also suitable for large wheels of cheese. (photograph: Agroscope)

application in each of the signatory States named in the application.

At the beginning of November, the implementation partners from the cheese and textile sectors shared their experiences to date at a workshop at Agroscope Liebefeld and agreed on the way forward.



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The Cheese-Ripening Process

Around half of Swiss cheese are smear-ripened – rubbed with a mixture of water, salt, and in some cases, cultures of microorganisms. Among them are traditional types such as Appenzeller, Tilsiter or Raclette, but also numerous local and regional specialties. Characteristic of these cheeses is their brownish-orange rind, consisting of a microflora – the so-called 'cheese smear' – which breaks down the lactic acid of the cheese, thereby contributing to its typical flavour. The new cheese-ripening process developed by Agroscope has a number of worthwhile advantages, since it requires significantly less effort than traditional smear ripening. The cheeses lose much less water during ripening, which speeds up the process and leads to a thinner rind, a more intense flavour and a softer texture. After ripening, the sleeve is very easy to remove. Since a small portion of the smear remains on the surface of the cheeses, they retain their characteristic identifying feature – the brownish-orange rind. Cheeses ripened according to this method do not develop any off-odours or stickiness in the prepackaging.

Implementation partners involved:

- Cheese sector**
- Gais mountain cheese dairy
- Merbach mountain cheese dairy
- Oberberg mountain cheese dairy
- Ermi Schweiz AG
- Institut Agricole Grangeneuve
- Flüeler Alpnach cheese dairy and Davos dairy
- Kässnacht village cheese dairy/ Intercheese
- Lustenberger & Dürst/ Kollercheese dairy
- Seiler cheese dairy
- Simmental Switzerland
- Ufficio consulenza agricola (alpine cheese dairies, farm processors and extension in Ticino canton)
- Tilsiter Switzerland
- Wildberg cheese
- Textile sector**
- E. Schellenberg Textildruck AG
- ISA Sellmann AG



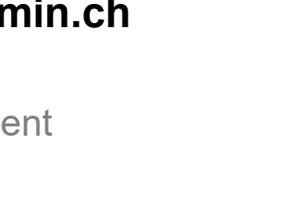
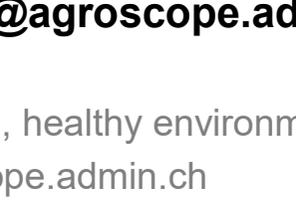
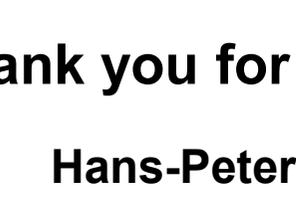
Implementation partner cheese sector

- Bergkäserei Gais
- Bergkäserei Marbach
- Bergkäserei Oberberg
- Emmi Schweiz
- Institut Agricole Grangeneuve
- Käserei Flüeler Alpnach und Molkerei Davos
- Küssnachter Dorfkäserei / Intercheese
- Lustenberger & Dürst / Käserei Koller
- Seiler Käserei
- Simmental Switzerland
- Ufficio consulenza agricola (UCA) e azienda agraria cantonale di Mezzana (AACM), Canton Ticino
- Tilsiter Switzerland
- Wildberg Käse



Implementation partner textile sector

- E. Schellenberg Textildruck AG
- ISA Sallmann AG



Thank you for your attention

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