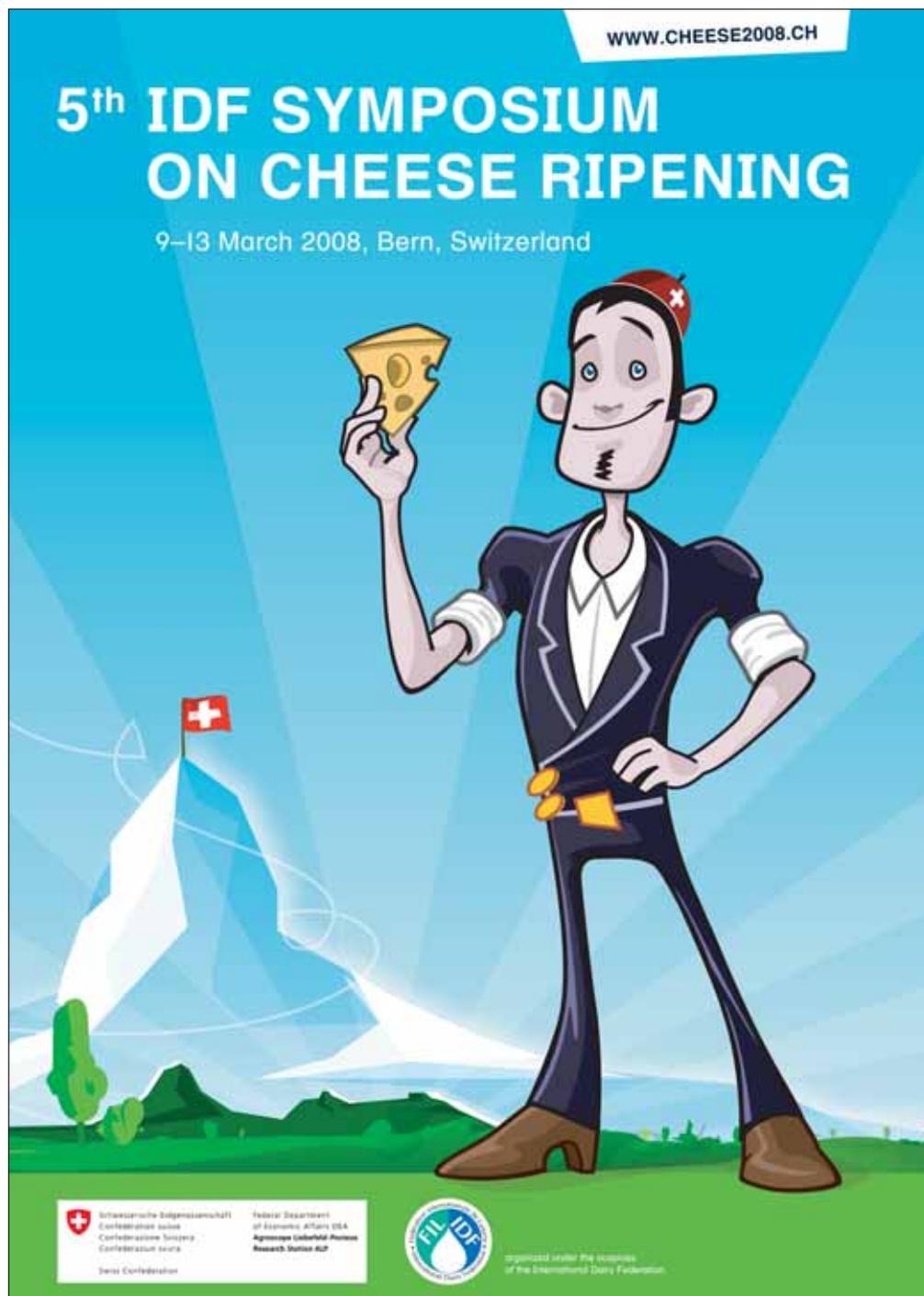


5th IDF Symposium on Cheese Ripening, Bern Switzerland, 9-13 March 2008

Technical-scientific information



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department
of Economic Affairs DEA
**Agroscope Liebefeld-Posieux
Research Station ALP**

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1. Introduction

In this issue of ALP Science we would like to record an unforgettable highlight in the recent history of Agroscope Liebefeld-Posieux Research Station ALP. We shall restrict ourselves to the essentials, but you can find various other items of information on the web page www.cheese2008.ch.

We set ourselves ambitious goals and in the main were able to achieve them. At this point our thanks go to everyone who contributed to this resounding success.

2. Welcome

We succeeded in getting Federal Councillor Doris Leuthard and various other key individuals to open the Cheese Symposium, which was a great honour for all of us and also made for easier access to the media.

2.1. Hans-Peter Bachmann, Head of the Local Organising Committee

Good morning Ladies and Gentlemen.

There is nothing like a dream to create the future.

I welcome you to the 5th IDF Symposium on Cheese Ripening in Berne. My name is Hans-Peter Bachmann; I'm the head of the research unit Milk and Meat Processing at Agroscope Liebefeld-Posieux Research Station ALP and the chair of the Local Organizing Committee.

I wish to welcome in particular

- Doris Leuthard, Federal Councillor and Head of the Federal Department of Economic Affairs
- Manfred Bötsch, Director of the Federal Office of Agriculture
- Urs Riedener, CEO of the Emmi Group
- Jörg Seifert, Technical Director of the IDF
- and Michael Gysi, my boss

I also wish to welcome most warmly

- The Program Committee
- The authors of the oral and poster presentations
- Our sponsors and partners (thank you very much for your great support)
- And last but not least: all participants from the international Cheese Community

There is nothing like a dream to create the future.

We, Ueli Bütikofer, Marie-Therese Fröhlich and I, had our dream eight years ago, during the third IDF Symposium on Cheese Ripening in Banff, Canada. It would be great to have this unique event in

Switzerland. Our dream became our great challenge and met with rapidly growing enthusiasm. Reto Burkhardt – our flight mechanic – helped us to take off.

Now I stand here very proud and I am sure I can offer you all a very attractive program. The scientific program consists of:

- 10 sessions that represent the most important current research topics
- 47 oral presentations
- 200 poster presentations
- as well as a lively informal exchange between more than 400 participants from 41 countries and all five continents

With the social events we wish to:

- introduce the great Swiss cheese tradition
- make sure that you have some unforgettable moments
- support informal exchange
- and, to present the Cheese Award to the "Best Cheese Scientist Worldwide"

And finally, there is Johann:

- Johann was invented by our agency Republica and inspired by the Local Organizing Committee
- He stands for the great traditions but also for the remarkably increasing innovations
- He says everything that we might think but would never say aloud
- He has a huge fan club (more than 3000 subscribers receive his newsletter "Cheese Inside" and he has promised to continue...)
- He was already cited once in the scientific journal "Medical Hypothesis"...
- And - of course - he will play an important role during the next 4 days too

It is our big aim to put our Research Station in place as an attractive partner for international cooperations. Please use this opportunity to challenge us. We would love it.

Thank you very much

2.2. Doris Leuthard, Federal Councillor and Head of the Federal Department of Economic Affairs

Technical Director,
Directors,
Ladies and gentlemen,

On behalf of the Swiss government it gives me great pleasure to welcome you to the 5th IDF Symposium on Cheese Ripening. It is an honour for Switzerland, and I personally am delighted that you chose Agroscope to organize this event. Agroscope is one of my department's research institutes. The pleasingly high turnout would seem to indicate that the programme has met with a great deal of interest. I hope that you will be comfortable with us and that you find the event informative. I would like to take this opportunity – on your behalf as well I'm sure – to thank the Agroscope Liebefeld-Posieux Research Station ALP for its work, and in particular the organisation team including Mister Bachmann, Mister Bütikofer and Mister Burkhardt!

As Economic Affairs Minister, my portfolio not only covers economic and foreign trade policy, and of course agriculture, but also vocational education, applied research and innovation, which is why education, research and innovation are also among my priorities. Education research and innovation are key factors in terms of employment, living standards and prosperity, especially for countries like Switzerland, which are not blessed with natural resources. Through your research, ladies and gentlemen, you make a significant contribution to an area which is vital to Switzerland's agri-food industry.

Over a third of our agriculture's gross earnings are generated through milk production. And practically half of all milk production is processed into cheese. In Switzerland the equivalent of 20 kilograms of cheese is consumed each year per head of population. Considerations such as health, taste, quality and lifestyle are playing an ever greater role. Agroscope, for example, has been able to demonstrate that Alpine and mountain cheeses are particularly rich in bioactive peptides, which have health benefits. The great impact of cheese, both for consumption and for the economy shows the importance of the theme of your Symposium.

We place great emphasis on strengthening the impact of agricultural research. Just as in other fields, this research has to be as practice-oriented as possible and meet the needs of the economy and society. Only in this way can we achieve an efficient use of resources. Fundamental research in agronomy is conducted by the ETH Zurich, a world-renowned Federal Institute. Applied research is carried out under the umbrella of Agroscope in my department. And it is fully in line with our successful innovation policy.

- First: The findings from its research should swiftly be translated into products and brought onto the market thus providing consumers with added value. Science to Market is crucial for success.
- Second: We want to recognise the challenges and needs of the agri-food industry at an early stage and put forward practical solutions. In order to achieve that we need to have



The opening of the symposium by Federal Councillor Doris Leuthard was a great honour and gave us all great pleasure.

good researchers and adequate structures, but also strong links between research institutions and industry. I'm therefore very glad that a hub and platform for innovation exists in the shape of Swiss Food Research, which brings together the relevant actors. I appreciate the fact and am grateful to the dairy industry, represented by Mr Riedener, CEO of Emmi AG, that it has also lent its support to the Symposium.

- Third: As the wheel of progress turns ever quicker in science as in other areas, there is a need to concentrate our forces. It has become almost impossible for an individual research station, like our organizers, Agroscope Liebefeld-Posieux, to undertake competent research across the board and to the necessary depth. Specialisation, scientific exchange and international networking are becoming increasingly important. That's what this Symposium is for! Switzerland cannot and has no desire to avoid the opening up of its markets. In a globalised market, factors such as quality, food safety and product traceability are ever more important. Profiles can be raised by means of products that are unique, that cannot be copied and have a clear origin backed up by strong brands. Agroscope, for example, developed special cultures for our AOC cheese where the traceability could be checked and consumers spared from deceptive products. At the same time the original is protected from being copied.

Because the Swiss agri-food industry is in need of long-term prospects, the Federal Council will soon tackle the subject of a possible take-up of negotiations with the EU on a full opening of the market in the area of agriculture and foods. Such an agreement would further improve the competitiveness of the Swiss agri-food industry. Both parties would benefit: the mutual market access for agricultural products is important for Switzerland as well as for the EU. Switzerland is the fourth largest consumer of agricultural products from the EU and absorbs 8% of its exports. Almost three-quarters of Swiss exports in the agri-food sector go to the EU. Incidentally, there has been free trade between Switzerland and the EU for cheese since last summer which has demonstrably proven to be beneficial for both sides. In 2007, 5.8% more cheese was exported than in the previous year – a new record.

As agriculture Minister I take the needs of the Swiss population and of farmers seriously. In order to be able to address these needs, farmers need optimal framework conditions because consumers, for their part, are becoming increasingly demanding: greater quality, freshness and safety, ecological production or processing methods and the fair treatment of animals with transparent declarations. They have a great deal of confidence in Swiss foods and value the careful treatment of the environment and animals. They attach importance to local and regional products, and the fact that they know how they were produced and by whom. Some of our products like cheese, chocolate, wine and biscuits are wellknown beyond our borders and have often won awards. We are not the land of cheese world champions for nothing!

The researchers from Agroscope, and you yourselves ladies and gentlemen, make a valuable contribution – and will continue to do so in future. Today, research must be able to supply sustainable solutions to relevant problems and do so in an increasingly global context. Responses have to be found for the challenges related to climate change and the safety of food production. That is why the new NutriScope research programme aims to provide consumers of agricultural products with the maximum in added value. That way the consumption of trace elements via dairy products is far more enjoyable than taking tablets or powders. Enjoyment and health don't have to be mutually exclusive! The partners involved in the programme achieve this by optimising the parameters that are decisive for the quality, safety, and health of food from sustainable domestic production all along the food chain – from cultivation to the end product.

I hope that this Symposium is beneficial for you as researchers and food producers, and for us as consumers, and provides you with solutions that you can put into practice. I will follow your progress with great interest. Agricultural research is important: assuring a sustainable agri-food industry is not only a challenging task, but also a noble one. Food and intact natural resources are among man's existential needs. In that regard, we all bear great responsibility.

Thank you for listening. I hope you have an enjoyable stay in Switzerland and a successful Symposium! I hereby declare the 5th IDF Symposium on Cheese Ripening open.



Hans-Peter Bachmann presenting Doris Leuthard with a bouquet

2.3. Manfred Bötsch, Director of the Federal Office of Agriculture

Federal Councillor,
Director General,
Ladies and Gentlemen,

It is a great pleasure for me to welcome you to the opening ceremony of the 5th IDF Symposium on behalf of the Swiss Federal Office for Agriculture and the management board of Agroscope. We are honoured to have you, as the world's leading scientists and experts on dairy production and products, here in Berne. In Switzerland, Agroscope – your host – is the centre of competence for applied research on agriculture, food and rural areas. With a staff of about 700, Agroscope has to answer to the needs of the players in the foodchain – from feed to fondue. Agroscope has also to carry out evaluations and propose options for the political challenges ahead of us.

In a country with a broad diversity of natural conditions, from permanent ice to palm trees within a distance of less than 100 km, and taking into consideration such issues as market deregulation, climate change, water, bioenergy, and an expanding world population with a rising purchasing power, the quantitative and qualitative supply of food is a demanding challenge facing us all.

In 1996, 80% of the Swiss electorate voted in favour of a new article to be added to the Swiss constitution which enshrines the concept of sustainable, multifunctional agriculture. Swiss people want a secure food supply and high quality products, but at the same time a diverse and well kept countryside, a rich biodiversity, clean water and fertile soils.

To fulfil this political aim we have implemented a reform process in various steps. First of all, we have shifted support from the internationally unpopular market intervention to direct payments. Nowadays around 80% of the financial support to agriculture and rural areas is through direct payments which are not linked to production (Greenbox). We have given up all intervention systems and of course exports subsidies; minimum or guaranteed prices do not exist any more and we have abandoned all quota systems – also in the dairy sector. If you are interested in finding out more about the Swiss agricultural reform process you will find some detailed information in your handouts.

So far there are no signs that this new policy will prove to be unwise; on the contrary, we can see that the dairy sector has become more competitive, better structured and more innovative. No wonder that milk and especially cheese production has risen! Of course, all these changes were demanding and it has not always been easy. It was therefore also important from a social point of view to devise a clear, direct reform process which allows time for adaptation. Overall, the achievements of the dairy sector deserve a good deal of respect. And we are convinced that, as a natural pasture-land country, the potential of Switzerland's dairy sector will be even greater in the future than it is today.

But to move on and improve we also need high-performance research and expansion. And that's your task. We are convinced that the presentations and discussions at this symposium will be to the benefit of all and will help to find ways of meeting the demanding challenges ahead of us. Knowledge is one of those rare assets which multiply by being shared!

Thank you for your participation and contributions.



Manfred Bötsch gives research an overwhelming vote of confidence

2.4. Urs Riedener, CEO of the Emmi Group

Dear Federal Councillor Mrs. Leuthard,

Dear representatives of the International Dairy Federation (IDF)

Dear representatives of Agroscope Liebefeld-Posieux (ALP)

Dear Mr. Bötsch (Director BLW)

Dear ladies and gentlemen, dear guests

I welcome you to an exciting week and thank the organisation committee for giving me the opportunity to speak to you briefly. Johann will be assisting me.

I would like to talk to you about five topics: cheese (of course!), Emmi, partnerships, science and market.

1. Let's talk about cheese!

Talking about cheese means talking about Switzerland. I am pleased that the symposium is taking place in Switzerland. Switzerland is known all over the world as the land of cheese. And here's why: cheese production in Switzerland, 2007: 176 280 tons (this is equivalent to around 4400 40-ton-trucks forming a queue over 70 kilometres long). These quantities are low in comparison with other export countries, but to make up for this we stand out with extraordinarily high-value products: world-famous cheese varieties are recognised according to regions in Switzerland – you all know Le Gruyère, Emmental and Appenzeller. These cheeses are still produced in village cheese dairies using raw milk, a unique process in today's world. This tradition guarantees that products are natural and of top quality. Swiss AOC cheeses are famous, because they are produced with no additives at all, which also guarantees a high level of product safety. Swiss cheese represents

naturalness, authenticity and quality. This has made them particularly popular abroad: Switzerland exports a third of its cheese production throughout the world (mainly to Italy, Germany, the USA and Canada). We are proud of this.

2. Let's talk about Emmi!

Let's talk about cheese by necessity also means let's talk about Switzerland – and then it's difficult to avoid discussing Emmi. So let's talk about Emmi! Emmi is the leading Swiss milk products company in Switzerland. We process around 850 million kilograms of milk each year. Emmi posted net sales of CHF 2'501 million in 2007, which corresponds to 7.1% growth. Emmi is the leading global Swiss cheese specialist.

2007 sales volume:

- Cheese in Switzerland: approx. CHF 500 million
- Cheese on international markets: over CHF 300 million

Emmi generates over 50% of its cheese sales volume abroad! Over 60 countries are supplied with our speciality products. As a producer, processor and exporter, we focus on top-class products with a high added value. Therefore: let's talk about our power to innovate! Traditional handwork forms the basis of our successful products. However, in addition to tradition, innovation is also required. Emmi constantly invests in research and development to improve existing products and to expand and maintain its leading role as innovator in Europe. Our milestones for Emmi's product development:

- Aktifit, Benecol and Evolus: we introduced our "daily portion of health" with these littlebottles 12 years ago.
- Energy Milk: milk to drink during breaks is traditional. Emmi virtually revolutionised this segment in Switzerland.



Urs Riedener assisted by Johann

- Emmi Caffè Latte – our star brand. Before Caffè Latte, cold coffee was unheard of. Thanks to natural Swiss milk and freshly-brewed espresso made from the best coffee beans. Emmi Caffè Latte has become a trendy drink in 17 European countries.
- Kaltbach: carefully selected cheeses are ripened in a natural sandstone cave. This makes Kaltbach cheese a delicious taste experience.
- SwissAlp: Emmi researched this concept for years. As a result, we produced the first cheese with an edible herb crust.
- Luzerner Yogodu: the first probiotic cheese in Switzerland with a yogurt-fresh taste. The development of this product was also very ambitious.

Without partners from the fields of science and research, these products would never have reached the high level of safety and taste they are at today. You are one of the central key success factors, ladies and gentlemen, enabling Emmi to fulfil our customers' requirements and to keep growing in the future!

3. Let's talk about partnerships!

Emmi itself employs around 50 people in the field of research and development. We count on a global network of scientists and experts for external know-how, particularly the Swiss-based Agroscope Liebefeld-Posieux ALP. At the moment, we are benefiting from the know-how of the experts at ALP with the development of our latest innovation, Yogodu, particularly with regards to cultures. In addition to your highly valued work, the cheese industry is also strongly influenced by political legality. Please allow me to say a few words on this topic, since the Federal Councillor and Minister for Economic Affairs Mrs. Leuthard is among us: overall, we are convinced that in the long-term, only an opening in the Swiss market for milk products will provide a good basis for success. For this reason, we are supporting the Federal Councillor's agricultural policies. It is of course important that we remain competitive with our foreign competitors. This does not only apply to investments, but also to research and development: even though we work with international research institutes, we rely on support from qualitatively superior and innovative research in our domestic market as a Swiss company. A recognised research which is part of an international network. This means that research carried out by institutes such as ALP or at universities need to be given the necessary support. Partners such as ALP, who provide us with applied research, are valuable. They are valuable because both partners – the researcher and the producer – can profit from one another. An interplay which we want to continue encouraging in the future. We rely on the results of research, which we use to develop cheese for the future. We also rely on positive partnerships which enable us to develop marketing concepts out of ideas with top quality products.

4. Let's talk about science!

Competition is becoming increasingly international. Good ideas are needed to keep our foothold in the market. In the case of cheese, the main focus is on indulgence. New taste experiences are in demand. We can only achieve this goal if we intensify and expand the global network and teamwork between research and the processing industry. And finally:

5. Let's talk about the market!

But what taste experiences are waiting for us in the future? This is, after all, decided by the market – which you are part of! What do you think is particularly delicious? Research what you would like to eat – and we will produce it! Because after all, science will eventually lead to an innovative product or an innovative technology. Innovation – our definition of innovation: a product is innovative if it is successful in the market. I am therefore pleased that you are taking part in this symposium. I will look forward to new impulse in our sector and wish you an exciting and inspiring week.

Thanks to Johann for his valued assistance. Thank you for your attention.

2.5. Jörg Seifert, Technical Director of the IDF

Distinguished Federal Councillor Mrs. Leuthard, distinguished Mr. Böttsch, ladies and gentlemen, dear colleagues of IDF,

It is a great honour and pleasure for me to welcome you on behalf of IDF to the 5th IDF International Symposium on Cheese Ripening.

The International Dairy Federation represents the interests of various stakeholders in dairying at the international level since 1903. There are 53 countries involved at present covering about 83% of world milk production. IDF provides the best global source of expertise and knowledge in dairy farming, dairy science, technology, economics and policies, analytical methods, regulation and nutrition in support of the development and promotion of quality milk and dairy products to deliver consumers with nutrition, health and well-being.

Through our events, IDF has gained worldwide recognition as a first source of reliable scientific-technical information and provider of guidance and advice on key issues impacting on the dairy sector. While IDF supports the generation and dissemination of scientific knowledge we place at the same time emphasis on industrial application in order to generate value and benefit to the dairy industry.

In today's context of globalisation we are faced with an increasing global demand for dairy products, and in particular cheese. This is caused in the first place by economic progress and growing wealth in some rapidly developing countries triggering changes in dietary patterns towards more nutrient-dense and western-style food. We are also observing in industrialized countries shifting consumer behaviour and preference towards food that meet enhanced expectations with regard to natural origin, freshness, limited use of additives, enhanced nutritional functionality, respect to the environment and convenience. As a direct consequence of these developments global production, trade and consumption of cheese have reached a record high and will continue to grow further in foreseeable future. I would like to mention just a few figures in order to illustrate the importance of cheese as the number one dairy commodity:

- Worldwide cheese production is currently about 17 Mill. tonnes.
- About 50% of all milk produced in Europe, that is 150 Mill. tonnes per year, is currently processed into cheese,
- Only last year, Switzerland has increased its cheese exports by roughly 6% to a record high of about 60.000 tonnes.
- Last but not least, the top three cheese consuming nations with a consumption of more than 23 kg cheese per person and year are France, Italy and Iceland – This confirms that cheese is a lot more than just food, plaisir and dolce vita but it is also essential to survive long arctic winters.

This symposium is the fifth of a series of highly successful events. This year we will be presented with findings related to:

- important microbial and enzymatic activities during cheese ripening,
- control of flavour formation and chemical analysis,
- sensory studies,
- texture, structure and functionality of cheese,
- influence of technology on cheese ripening, and
- packaging and safety.

All of these aspects contribute to the improvement of manufacturing and ripening procedures and quality of the final product. They enable technological innovation and enhancement of functional and physiological properties of cheese in order to increase nutritional value and consumer confidence.

On behalf of IDF, I would like to thank the Organizing Committee and the international Scientific Programme Committee for their outstanding commitment and excellent work in organizing an event with a top-class programme. I would like to mention in particular our Swiss colleagues who were leading the process: Dr. Gysi, Dr. Bachmann and Mr. Bütikofer of ALP Research Station.

I would also like to thank you, our excellent scientists and technologists who generate the knowledge and technological application in cheese manufacturing and ripening. You are the base element of the cheese value chain that enables our industry to flourish today and in future. IDF feels very honoured and glad to see so many of you here today, including some who have travelled a very long way.

Distinguished ladies and gentlemen, dear colleagues, on behalf of IDF I would like to wish you an interesting and successful event!

Thanks for your attention.



Jörg Seifert welcomes the Symposium participants on behalf of IDF

2.6. Michael Gysi, Director of the Agroscope Liebefeld-Posieux Research Station ALP

Ladies and Gentlemen

I welcome you all most cordially in Switzerland, the land of cheese. I hope you all had a good journey and have found agreeable lodgings for the next days.

I am particularly pleased that we are able to hold this important symposium in Switzerland this year because I am convinced that this will be a positive landmark in the cheese research sector. Of course, I hope that this will also create new catalysts for research in Switzerland in general and for Agroscope Liebefeld-Posieux Research Station ALP in particular. Furthermore, I am very happy that this symposium has found such a lively and positive response in the cheese industry and within the Swiss political sphere. Proof of that are the welcoming words by the Federal Councillor of Switzerland Doris Leuthard.

Research in the cheese sector is alive. The overwhelming interest and large number of participants prove this point. The many PhD students and postgraduates who have registered for the next few days are further evidence for the fact that there are innovative movements and new starts in this industry. This gladdens my heart more than anything, since I am totally convinced that innovative products are indispensable if we want to be successful in deregulated markets.

This year's symposium is organized by Agroscope Liebefeld Posieux Research Station, ALP for short. ALP is a research institute that

concerns itself with topics from animal feed to production and processing to animal products. Our location in Liebefeld is well known to most of you since Liebefeld has had a long tradition of research and knowledge transfer within the cheese sector. ALP is part of agricultural research in Switzerland which has been merged under the umbrella brand of Agroscope since 2003. You have the opportunity to learn more about ALP on a special hiking trail in the conference center.

In future, Agroscope and ALP in particular will play a larger international role as a result of a Peer Review carried out in 2006. Therefore, this year's symposium is a welcome and unique opportunity for ALP to extend our network and gain more international partners for research and knowledge transfer.

If I reflect on the past months and weeks of preparation, they have been marked by the deepening acquaintanceship with Johann the Cheesemaker from upper Berne! And the work to prepare the ground for this symposium was truly enhanced by the contact with the extraordinarily dynamic Local Organizing Committee. I must take this opportunity to thank in particular Hans-Peter Bachmann, Reto Burkhardt and Ueli Bütikofer for their tireless work during the recent past. The schedule was also helped by the strong support from the Swiss Cheese Industry and the IDF. I thank you all from my heart, without you this congress could not have taken place in this form.

Finally, there is nothing left for me but to express my hope, that we all shall find this symposium very interesting and encounter many stimulating experts and personal contacts. I very much look forward to it!



Michael Gysi delivers his speech at the Welcome Reception

2.7. Jürg Simon, President of the Emmentaler Switzerland Organization

Ladies and Gentlemen

Welcome to Switzerland, welcome to Berne, welcome to the country of origin of the world-famous, original Emmentaler Cheese! The Emmentaler Cheese was born nearby, very close to here in the valley of Emmental which still is giving this cheese its name. Even if it may not be scientifically fully reliable, we believe that this birth took place about 800 years ago, and this – at least – is a good story.

Today, Swiss Emmentaler is about 6'000 people, milk producers, cheese makers, ripeners and trading companies. We produce about 32'000 tons of Emmentaler Cheese per year. 70% are exported all over the world, main markets being Italy, Germany, France, the Benelux countries, USA and Canada. There are a lot of new activities in other markets where our people have already been selling cheese 100 years ago, namely in Russia, even in Australia, Japan and – of course – in the Eastern European countries. The total turnover of Swiss Emmentaler Cheese, calculated on the basis of consumer prices, is between 700 million and one billion Swiss francs. Emmentaler Cheese is the most important agricultural product of Switzerland. It is part of the soul of this country.

What are the tasks of my organisation?

- Firstly: Quality control, quality control, quality control.
- Secondly: The protection of the name and the reputation of the product through, e.g., an appellation of origin, trademark rights, other IP-rights, such as patents, bi- and multilateral agreements, if needed even court procedures.
- Thirdly: Marketing and communication. We, as an organisation, are the trustees of the product. The trustees of the history, the present and the future of the product.

What are our expectations with regard to science and with regard to US scientists? First of all, we believe that basic science must be free and fully independent, especially in matters as delicate as health and food. When it comes to applied science, we believe that science must help us to always better understand the product, its quality and health implications and also help us to better act against counter features. In other words: milk and cheese science is the bridge between tradition and the future of the products.

With this in mind, Emmentaler Switzerland and I, myself, wish you a successful week with plenty of work ahead and, of course, plenty of excellent cheese tasting.

Thank you.



Jürg Simon describes current challenges

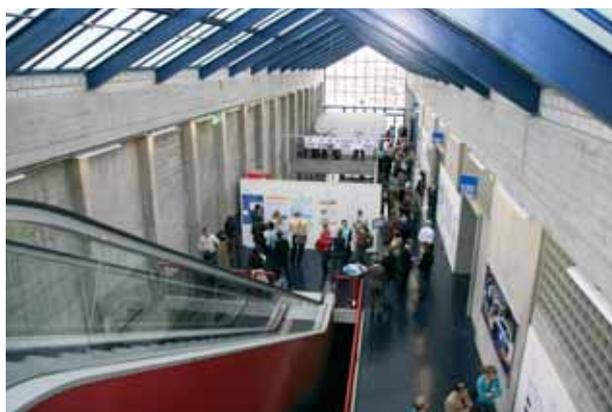
3. Development of the Scientific Programme

At the last meeting of the Symposium on Cheese Ripening 2004 action team in Prague on 25 March 2004 the programme committee for the next symposium was already formed and the objectives of the next symposium on cheese ripening in 2008 prepared: the 5th symposium would deal with cheese ripening, microbiology, characterization and flavour formation. The program would cover the latest scientific findings on important microbial and enzymatic activities during cheese ripening, control of flavour formation and chemical analysis, sensory studies, texture, structure and functionality of cheese and the influence of technology on cheese ripening as well as packaging and safety.

Just after the 4th IDF Symposium on Cheese Ripening in Prague, Hans-Peter Bachmann presented the proposal for hosting the next symposium in Switzerland at the meeting of the Standing Committee of Dairy Science and Technology (SCDST) (26 March 2004). Other countries were also interested in organizing the next symposium. After discussions the SCDST decided to organize the next symposium on cheese ripening in Switzerland in spring 2008.

The homepage www.cheese2008.ch was created and the available information was already online in April 2004.

On 18 May 2004 the IDF Programme Coordination Committee (PCC) approved the candidate event. Ueli Bütikofer (CH) would again be the chair of the programme committee, Hans-Peter Bachmann (CH) the chair of the local organization committee.



Altogether 200 posters were presented in 3 sessions

At the first meeting of the programme committee on 19 April 2005 in Cork (Ireland), Ueli Bütikofer informed the programme committee that the symposium would be held at the BEA expo conference centre in Bern. The sessions of the symposium were defined and possible keynote speakers were nominated.

The newsletter "Cheese Inside" was created in July 2006 and distributed directly from the symposium website. More than 3000 persons received the newsletters from Johann. By February 2008 eleven newsletters had been distributed.

In July 2006 the first announcement and call for papers was distributed in printed and electronic version. From the call for papers we received more than 80 abstracts, which were rated by the programme committee. For the selection of abstracts we also had the IDF idea in mind and chose many different countries and young scientists. Each session would be introduced by a review lecture and completed with some short presentations of actual work by the different research groups.

From this selection the final announcement and call for posters was prepared and distributed with the newsletter on 28 August 2007. The printed version (3000 copies) was sent directly to many interested persons and organisations and distributed at the IDF World Dairy Summit in September 2007 and at several other dairy events.

By 1 February 2008 over 220 abstracts for poster presentations had been submitted. More than 200 abstracts were accepted for poster sessions. Because of the huge amounts of posters, they could be displayed only for one day.



With more than 400 participants the Symposium was booked out

4. Summary Oral and Poster Sessions

It is impossible to report here on all the scientific papers presented. The summaries concentrate mainly on the oral sessions.

4.1. Nutritional and Health Aspects

The first session of the Cheese Symposium covered lectures on the nutritional and health aspects of cheese, and started with an overview of cheese in nutrition and health by Barbara Walther (Agroscope Liebefeld-Posieux ALP Research Station). Cheese is rich in essential nutrients, particularly amino acids, bioactive peptides, fatty acids, vitamins and minerals. The absence of lactose was mentioned as a possible advantage, as approximately 70% of the world population are lactose intolerant. As regards health, cheese has a positive influence on bone density and body composition among other things, and can help prevent caries. Various constituents are responsible for these properties. The bioactive peptides are known mainly for lowering blood pressure. VPP and IPP occur naturally and in significant quantities in (mature) cheese varieties, but whether this means that cheese has a positive effect on blood pressure remains to be determined in human studies. Calcium has further positive properties as well as its strengthening effect on bones, for example an influence on weight management, high blood pressure and caries prevention. As cheese is a complex food, it is not always obvious to which ingredient a particular positive effect can be attributed. It is generally a matter of several constituents and/or their interactions.

Lactobacillus gasseri K7 has probiotic properties. Bojana Bogovic Matijansic from the University of Ljubljana (Slovenia) presented a study on *Lb. gasseri* K7 as a starter culture. This showed that *Lb. gasseri* K7 is not suitable as a starter culture on its own. A palatable cheese can, however, be produced in combination with *S. thermophilus*. The cheese was inoculated with *C. tyrobutyricum*

in order to investigate antimicrobial properties. This was successful in delaying cheese swelling and also reduced the concentration of butyric acid.

Depending on the sensitivity of the consumer (e.g. asthmatics), biogenic amines can trigger various symptoms, some of them very severe. Tomas Komprda of the Mendel University of Agriculture and Forestry Brno (Czech Republic) and his team determined the tyramine content in semi-hard Dutch cheese in which the parameters of ripening time, distance from the centre of the cheese and fat concentration were varied. Tyramine concentration increased with the degree of ripening, but was also dependent on the cheese starter cultures. The highest values were measured in the outer zone of the cheese. Fat content had no significant influence on the concentration of this particular biogenic amine.

Helmut Mayer of Vienna University presented a method for determining biogenic amines in cheese. Nineteen biogenic amines in cheese can be reliably quantified within nine minutes using Ultra Performance Liquid Chromatography (UPLC). Very substantial differences were found when determining these amines in commercial cheese samples from Austria. Approximately 25% of the samples investigated had a value of more than 100 mg/kg cheese, concentrations of up to 2800 mg/kg were found in some cheese varieties.

The session was rounded off by Antonio Pirisi of AGRIS Sardegna – Dipartimento per la Ricerca nelle Produzioni Animali (Italy) with a presentation on the development of pathogenic bacteria in AOC Pecorino Romano cheese. This cheese has to be made from raw or thermised ewes' milk. A study was carried out to investigate the growth and survival of various pathogenic bacteria during production and ripening. After only 90 days (the commercial ripening period is at least five months) the pathogenic bacteria inoculated were no longer detectable. As the physico-chemical parameters of the trial cheese remained the same, this would lead to the conclusion that the results can be transferred to commercial cheese.



Barbara Walther, Keynote Speaker on Nutritional and Health Aspects

4.2. Influence of Milk Production Conditions on Milk and Cheese Quality

In his overview paper, Bruno Martin of the Institut National de la Recherche Agronomique (INRA) in France propounded that the great variability in different milk constituents is also partly associated with animal feed. This is particularly true of the fatty acids (especially oleic acid, 100% of which originates from feedstuff), the carotinoids, vitamins A and E, and of secondary plant metabolites such as terpene and phenolic components and inherent milk enzymes. An increase in the grass fraction at the expense of maize silage or fodder concentrate results in the stronger colouring and softer texture of butter and cheese due to the higher level of β -carotenes and unsaturated fatty acids, particularly oleic acid, at the expense of saturated fatty acids C10 to C18. Raw milk cheese from pasture-based milk production generally has more taste. This effect seems to disappear when milk is pasteurised.

Within a grass-based feeding regime the feedstuff preservation factor (pasture vs. silage/hay) has the greatest impact on the sensory and nutritional characteristics of milk and dairy products. The influence of the preservation method chiefly affects the yellow colouring or carotinoid content of products (greater in the case of silage than of hay), but also the flavour of large size model cheeses. Various recent experiments have shown that the botanical composition of grassland exerts a significant influence on the fatty acid pattern and the texture and taste of cheese. Supplementing the feed ration with vegetable oils or oilseed produces similar or even greater effects, but at the same time leads to an increase in the trans-isomers of oleic acid and linoleic acid and can sometimes stimulate fat oxidation, thus leading to off-flavour in milk and cheese. The development of off-flavour seems to be dependent on the way the lipids are supplied (oil or oilseed) and on the presence of antioxidants.

Giovanna Batelli's Milan research team investigated the effect of moving herds of cattle from one summer alpine meadow to the next using as an example Bitto-Käse, a variety of alpine cheese from the Valtellina region (Italy). On each alpine meadow the botanical composition of the alpine pasture was recorded and samples of milk and cheese taken (after 70 days' ripening) to determine the volatile components. The change in flora with the change in altitude (1200 to 2200 m above sea level) produced major changes in the composition of the terpenes in the milk and cheese. The levels of δ -3-carene therefore increased with altitude. The terpene profiles of milk and cheese were similar. Changes were also found in relation to the volatile acids, esters, alcohols and ketones formed during cheese ripening. They were, however, unsuccessful in defining a typical profile for Bitto-Käse due to the major influence of the dramatic variation in conditions affecting alpine cheesemaking. The terpene profiles tend to be more suitable as an indicator of feedstuff type, less so as proof of origin.

George Leitner of the National Mastitis Reference Center (Israel) presented the results of trials carried out to determine the curdling ability of mastitis milk, depending on the mastitis pathogen. A

comparison was made between milk from cows with subclinical mastitis caused by *Staphylococcus aureus*, *Escherichia coli*, *Streptococcus dysgalactiae* and *Streptococcus chromogenes*, which resulted in similar cell count increases and significantly lower yields of milk and cheese. Although levels of fat, protein and casein were unchanged, the renneting ability of the milk from infected udders was very much worse and in the first two weeks the cheeses lost two to three times more water than cheese made from normal milk, and after four months' ripening its curd strength was significantly greater. From milk the authors isolated proteose-peptones, which are greatly increased in mastitis milk, added these in freeze-dried form to sterile milk and made this into cheese, with an equally negative impact on the curdling ability of the milk. This led the authors of the study to conclude that it is the reactions of the animal organism to infection which lead to the deterioration of curdling ability and not change in the milk itself, e.g. changes in content.

Cláudia Pereria of the Universidade Católica Portuguesa in Oporto (Portugal) studied the influence of lactic acid bacteria from raw milk on cheese quality. As a rule traditional Portuguese cheeses are made from raw milk, the inherent microflora of which, particularly lactic acid bacteria, play an essential role in cheesemaking. The raw milk flora is one source of the variability of end product quality, which can be brought under control by standardising production conditions and using defined starter cultures. Part of the research work presented included a model system developed to simulate the traditional production process. This model system was used to conduct multifactorial trials for the study of the influence of different lactic acid bacteria (*Lactobacillus plantarum*, *Lactobacillus brevis* and *Lactococcus lactis*) and two types of rennet (animal and vegetable rennet) on sugar breakdown and proteolysis in cheese made from sterilised ewes' and cows' milk. Lactococci exhibited the greatest souring ability irrespective of milk type. The species differed chiefly in relation to lactose breakdown and in the profile of the organic acids in the cheese, with the type of rennet greatly affecting proteolysis (significantly greater proteolysis when using vegetable rennet).



Bruno Martin, Keynote Speaker on the Influence of Milk Production Conditions on Milk and Cheese Quality

4.3. Starter and Ripening Organisms

In his introductory paper Prof. Christophe Lacroix of the Laboratory for Food Biotechnology at ETH Zurich provided a comprehensive overview of current research in the field of acidification, ripening and protective cultures, which in many different ways exert a crucial effect on the quality, safety and functional properties (e.g. bioactive peptides) of cheese. He explained the development of bacteriocin-forming cultures, which have so far been slow to find practical application. He thought that the use of protective cultures for smear-ripened cheese and the production of cheese with probiotic cultures held a lot of promise for the future. Antibiotic resistance as a potential safety risk will also continue to be a subject of research.

Muriel Charlet, INRA, Poligny (France) presented new results on the growth dynamic of strains of thermophilic *Lactobacillus delbrückii* in Emmental cheese and their influence on the ripening process.

Because of their relatively high peptidolytic activity, adjunct cultures such as *Lactobacillus (Lb.) helveticus* are increasingly being used to accelerate ripening and aroma formation in various varieties of cheese. Marie Penderup Jensen of the University of Copenhagen (DK) examined the caseinolytic activity of six *Lb. helveticus* cultures in model cheeses and showed that peptide patterns were dependent, among other things, on strain-specific autolytic capability.

Markus Schuppler, Laboratory for Food Microbiology, ETH Zurich, demonstrated possible methods of recording early contamination by pathogens (e.g. listeria) and secondary flora on smear-ripened cheese, and hence potential production failure, using the rapid

16S rRNA gene-based tRFLP (Terminal Restriction Fragment Length Polymorphism) Fingerprinting Method.

Wilhelm Bockelmann of the Institute of Microbiology and Biotechnology in Kiel (Germany) dealt with the development of defined surface cultures for the reduction of contamination risk by enterobacteriaceae, enterococci and pseudomonads. Special efforts are being made to improve the protective cultures (particularly yeasts, staphylococci) against *Listeria monocytogenes* and to promote the formation of typical colourings caused by rind flora.

Defined *Lactococcus lactis* multistrain cultures are increasingly being combined with *Streptococcus thermophilus* strains in order to prevent phage problems in Cheddar cheese production. John Hannon, Moorepark Food Research Centre of Cork (Ireland) described the influence of this adjunct culture on the ripening process.

Koenraad van Hoorde, University of Ghent (Belgium), discussed the technique of PCR-Denaturing Gradient Gel Electrophoresis (PCR-DGGE), used to record bacterial diversity in traditionally made Gouda cheese.

The talks and numerous poster presentations highlighted the great importance of starter cultures, which have to meet various requirements (e.g. economic viability, safety, accelerated cheese ripening, additional health benefits).



Christophe Lacroix, Keynote Speaker on Starter and Ripening Organisms

4.4. "Omics" Techniques

The session on "omics" techniques was introduced by a keynote paper from Tom P. Beresford. There were a further four abridged papers on this subject.

In the first part of his keynote paper, Tom Beresford gave a general overview of the subject. Omics techniques are still a young branch of biological science, credited with bright future prospects. "Omics" are generally understood to be the comprehensive analysis of information and data present within a biological system (e.g. a cell, tissue, organism). The foundation stone of omics techniques was laid in 1995, when the genome of the *Haemophilus influenzae* bacterium was sequenced and published. This was the first time the totality of an organism's hereditary information (= genome) had been elucidated. Just 12 years later the genome information for around 700 other organisms is available. By analogy with the word genome, researchers talk of transcriptome, proteome and metabolome when describing all the transcripts (RNA), proteins and metabolites (products of metabolism) in a biological system.

Cheese is a biological system, firstly because milk is of biological origin and secondly because microorganisms play a crucial role in its production and ripening.

The Hereford cow genome has been decoded, and in the near future we will also be familiar with the genomes of other breeds of cattle as well as those of sheep and goats. At the same time more is being learnt about the milk proteome of the cow and, in addition to the caseins, lactalbumin and lactoglobulin, 95 other specific milk proteins occurring in small concentrations have been identified. Moreover, more than 400 different fatty acids and,

in addition to lactose, various other sugar compounds such as glycanes, glycolipids, glycosamines and free oligosaccharides have been described in cows' milk and researchers are already talking of milk lipidome and glycome.

As regards microorganisms, we know the genomes of numerous bacteria which specialise in the milk environment, e.g. *Lactococcus lactis*, *Streptococcus thermophilus* and various *Lactobacillus* species. We are now beginning to analyse the transcriptomes, proteomes and metabolomes of these species and can expect more detailed data to become available over the next few years.

In the second part of his talk Tom Beresford discussed the characteristics of the *Lactobacillus helveticus* DPC 4571 genome sequenced by his research team. 2065 potential genes and 213 insertion sequences were identified in the genome. The latter are suitable for the identification and hence the differentiation of strains. This very information has already been used for several years by Agroscope Liebefeld-Posieux Research Station ALP for proof of origin.

In his abridged presentation John Hannon of Moorepark Food Research Centre (Ireland) postulated that traditional methods are inadequate for studying the sequential effect of enzymes during cheese ripening and for throwing light on the origin of these enzyme activities. He chose a proteomics approach to investigating the influence of *Streptococcus thermophilus* added to a mesophilic starter culture in Cheddar cheese. The technology was used to isolate 200 proteins from the cheese matrix, and 46 were identified as milk, lactococcal and streptococcal proteins. In this context, it was shown that the amount of glutamate dehydrogenase from *S. thermophilus* increased during ripening, however it was not possible to clarify the role played by this enzyme in aroma development.



Tom Beresford, Keynote Speaker on "Omics" Techniques

Mireille Yvon of INRA in Jouy-en-Josas (France) and Sylvie Lortal of INRA in Rennes (France) presented proteome and transcriptome data on *Lactococcus lactis*. Only small changes in the proteome of *L. lactis* were observed in a comparison of 1 day-old and 7 day-old cheese. On the other hand, significant differences were found when investigating the proteome of two different *Lactococcus* strains in cheese. Using the methodology it was possible to identify 60 proteins specific to the S1 strain and 60 specific to the S2 strain. The data led to the conclusion that the S1 strain, for instance, mainly produced the enzymes for the Leloir metabolism and for the production of diacetyl and acetoin, whereas the S2 strain synthesised the enzymes for the tagatose metabolism and ethanol formation. Transcriptome data were presented from the first 24 hours of cheese making only. This showed that numerous changes in the composition of the starter culture RNA took place during the first 24 hours. No studies were conducted on whether the proteome likewise undergoes major changes during this period.

Hélène Berthoud of Agroscope Liebefeld-Posieux ALP Research Station talked about the practical applications to which genome information can be put. The number and distribution of insertion sequences in the genome is strain-specific and can therefore be used for strain identification. It follows that genome analysis can be used as a means of identifying these strain-specific gene sections. This information can then be used to determine the cultures used to produce a cheese, which means that the geographic origin of the cheese can also be traced. It was demonstrated how the technology has already been successfully used to identify Emmentaler cheese made in Switzerland.

In concluding the session on "Omics Techniques", the researchers noted that to date the controlled fermentation of foodstuffs such as cheese has been carried out on an empirical basis. More procedures have been described than are actually understood. This is because the quality of fermented foods is attributable to the microorganisms present in the food and to their metabolic activities. There is great biodiversity within the microorganisms (e.g. lactic acid bacteria), and these organisms therefore contain vast potential for metabolic and enzyme activities, modulated by the food matrix and the environment. The interactions of various bacterial strains in particular are not as yet understood and are unpredictable. Omics techniques have the potential to bring about a better understanding of the biological processes occurring during cheese ripening. There are high hopes that these techniques will be able to provide answers to questions such as biodiversity, the adaptation of microorganisms to a milk environment, the specific activation and identification of new metabolic activities. Researchers are confident that many new findings on this subject will be presented at the next IDF Symposium.

4.5. Flavour Development Measured with Sensory and Instrumental Methods

At the beginning of her keynote lecture “Cheese flavour measured with sensory and instrumental methods: a review”, Stefania Carpino from CoRFiLaC (Ragusa, Italy) gave a brief overview of selected methods currently used in sensory evaluation. The importance of flavour for the acceptance of a product was emphasized. Extraction and concentration techniques for the detection of volatiles were then presented. Advantages and disadvantages of the selected techniques were mentioned. Detection systems were listed with a focus on the Human and Electronic Nose.

In a second step, studies combining sensory and instrumental measurement of flavours were presented. A classification of Ragusano PDO cheeses from different Sicilian production areas performed with both sensory descriptive analysis and MS-based Electronic Nose thus lead to similar results, separating gold quality cheeses from good quality ones.

In another study the influence of pasture on the odour active volatiles of Ragusano cheese was measured by means of GC/O. Results indicated that cheeses made from the milk of pasture-fed cows were richer in aromatic compounds than “control” cheeses. Eight aromatic compounds unique to “pasture” Ragusano cheese were identified in particular.

A third study focussed on the sensory characteristics of Ragusano cheese made from the milk of pasture-fed animals as compared to cheese produced from the milk of animals fed a mixed ration. The “pasture” cheeses showed significantly stronger floral and green/herbaceous notes as well as higher overall aroma intensity.



Stefania Carpino, Keynote Speaker on Flavour Development Measured with Sensory and Instrumental Methods

A study on the geographic differentiation of Pecorino Siciliano cheeses by Electronic Nose and Sensory Analysis allowed the separation of 45 cheeses on the basis of their production area. Both methods led to similar results

In his presentation “Flavour production of Stilton blue cheese microflora” Kostantinos Gkatzionis (University of Nottingham, UK) showed results of a study on the microflora and aroma profile of Stilton. Stilton is an internally mould-ripened semi-soft blue cheese consisting of three parts: blue veins, white core and outer crust. The study focussed on the role of yeast flora and penicillium roqueforti in aroma production and on their interactions. Different yeast communities were found in the three parts, leading to different aroma profiles. As for p. roqueforti, it was not found in the outer crust. On the basis of these findings model systems combining different cheese isolates and p. roqueforti were studied with regard to their aroma production. The aroma profile of one model was similar to the blue cheese aroma.

Romdhane Karoui from Enita Clermont (Clermont-Ferrand, France) presented a work on the “development of an integrated low-cost fiber optic based spectrofluorimeter for measuring the quality of cheeses”. A portable spectrofluorimeter was developed as an answer to the need of the cheese industry for rapid methods allowing the measurement of chemical parameters in real time. Its performance was investigated by comparison with a laboratory spectrofluorimeter. Parameters such as pH, fat, dry matter, total protein and soluble protein were measured with both devices in 12 French semi hard cheeses. The results of the portable device were similar to those of the laboratory one, with the advantage of being faster (1 sec for the portable versus 2 min for the laboratory spectrofluorimeter).

Lene Andersen from the Department of Food Science of Copenhagen University (Denmark) presented a study conducted on Cheddar cheese with the aim of identifying low molecular weight peptides and amino acids responsible for the umami taste. Umami is a Japanese word meaning “savoury”, “delicious”, and is related to the sensation evoked by components such as glutamic acid. Water-soluble extracts from mature Cheddar cheeses were fractionated and the fractions with savoury properties as determined by sensory evaluation were selected. No hydrophilic peptides with glutamic acid were found in these fractions.

Ylva Ardö, chair of this session, pointed out that a lot of work has been done in recent years in the field of sensory characterization of cheese, thus allowing a better understanding of consumer choice and the development of cheese products satisfying consumer needs. Flavour being one of the key criteria for food choice, the studies conducted in the analysis of volatile flavour components and in the analysis of amino acid and peptides are of great importance.

4.6. Characteristics of Traditional, Regional Cheese

Varieties

Regional specialities are enjoying increasing popularity in international cheese marketing. The IDF Symposium afforded a unique opportunity of learning more about the characterisation of regional and traditional cheeses.

In his introductory paper, Efstathios Alichanidis, Emeritus Professor of the Aristotle University of Thessaloniki, presented an interesting overview of the wide variety of cheeses in the Eastern Mediterranean. He gave examples to show how the climatic conditions in this region shape milk production and traditional varieties of cheese. Nomadic sheep and goat husbandry was originally dominated by very seasonal milk production due to the hot climate. More than 50% of cheese consumption in these countries is accounted for by brine cheese, which often contains herbs as well. A characteristic of the Feta, Domiati, Teleme, Beyaz peynir and Zlatarski types is that the curd does not undergo heat treatment. In brine cheeses such as Batzos, Mihalic and Sfela the curd is slightly burnt (< 45°C), and in varieties like Halloumi or Nabulsi is even heated in whey or brine. Other notable specialities from this region are the *pasta filata* cheeses Orgu, Dil and Civil, which are made from ewes' and goats' milk and stored in brine. The production of semi-hard *pasta filata* cheese such as Kashkaval, Kasseri and Kasar peyniri is also widespread. The widely varied Eastern Mediterranean cheeses also include ricotta made from ewes' and goats' milk whey (e.g. Anthotyros, Manouri) and hard cheese produced from ewes' milk, with names like Gravyer, Graviera Kritis or Kefalograviera unmistakably pointing to Swiss influences (Gruyère). Even today the production of ewes' and goats' milk is still of great agricultural importance to this region, although the proportion of cows' milk has increased enormously in recent decades. Following changes in the raw material supply, traditional cheeses on the market are increasingly being replaced by eponymous substitutes made from cows' milk, the sensory qualities of which bear only qualified comparison with the original ewes' and goats' milk products.

In her paper Monica Gatti from the University of Parma presented a study on the ripening pattern of Parmigiano Reggiano. The aim of this study was to arrive at a better understanding of the microbiological and enzymatic processes which take place during the long maturing period of this variety. Various parameters (lactic acid bacterial flora, autolysis, enzyme activity, proteolysis) were subjected to detailed study during the course of ripening in order to determine the influence of starter and raw milk flora on the ripening process.

The paper presented by Marie-Therese Fröhlich-Wyder of Agroscope Liebefeld-Posieux Research Station ALP dealt with recent studies carried out by ALP in relation to the influence of calcium on the melting qualities of raclette. The effect of various technological factors on the levels of soluble and bound calcium were examined using model raclette as an example. This showed that the rheological and sensory qualities of raclette are greatly dependent on bound calcium content.

Diane van Hekken of the Agricultural Research Service (USA) presented a paper on the sensory and rheological properties of Mexican Chihuahua cheese. This semi-hard cheese is an easy-to-melt Cheddar variant which is ready for consumption after maturing for just 2-4 weeks, and which in Mexico is traditionally made with raw milk. In the USA, however, it can only be marketed as pasteurised cheese. The results of this study showed that the traditional raw milk variant is perceived as being sourer, more bitter, more piquant and softer.

Nihat Akin of Selcuk University (Turkey) used his paper to report on the use of pregastric lipases in the production of Kasar cheese. Today this *pasta filata* cheese is made mainly from pasteurised cows' milk, the traditional variant still being processed from up to 40% ewes' or goats' milk. Acceptance of the flavour of Kasar made from pure cows' milk can be significantly improved by the addition of lipases.



Efstathios Alichanidis, Keynote Speaker on Characteristics of Traditional, Regional Cheese Varieties

4.7. Process Analysis and Control

Ola Lindblad of ARLA Foods (Sweden) highlighted the economic value placed on process control in a cheese dairy. Milk, a natural product, varies in composition for example. In the cheesemaking process it is important to detect and record these variations and reduce them to a targeted minimum once the causes are known, so as to produce a consistent end product which conforms as closely as possible to specification and avoid wasting money. The example used was the variation in water content of a batch in which all the cheese is not pressed at the same time. A comprehensive process control system was developed: in addition to the continuous online recording of the relevant process data in real time by appropriate measuring systems of adequate precision (by contrast with offline measurements in the laboratory), this also involved the subsequent processing of these huge amounts of data by specialist process IT tools, for example by means of statistical process control.



Ola Lindblad, Keynote Speaker on Process Analysis and Control

Siv Skeie from the Norwegian University of Life Sciences discussed the influence of various dairy plants at three production facilities on the quality of Norvegia and Präst cheese. Another topic was the determination of the relevant characteristics suitable for predicting the development of cheese quality. The differences in cheeses depended on different ripening, different production locations, and interactions between production location and ripening. Flavour was best predicted on the basis of the composition of the free amino acids, which were measured by means of near-infrared reflection spectroscopy (NIRS).

Ulrich Kulozik from the Technical University of Munich presented a paper on autocatalytic multi-stage structural formation reaction using the example of fresh or processed cheese. The structural formation process (viscosity, apparent viscosity) was recorded online by a rheometer. Electron microscope images testify to the fact that, when acted upon by emulsifying salts, the networks formed by merging casein micelles (with interspersed fat globules) degrade and break down into particles the approximate size of casein submicellae which are then dispersed in the aqueous phase. The cheese therefore loses part of its structure and changes from a gel to a sol. The structural formation reaction can be speeded up by

the following process parameters: preceding two-stage homogenisation, residence time, shear intensity and product recirculation (7-10 % rework as catalyst) as well as by product composition and protein reactivity (optimum pH value: 5.80), also melting salts and emulsifiers. For the rapid structure formation of processed cheese (46 % dry matter) the aim should be to obtain a fat content of 15-20 % and a protein content of 17 % (native caseins simultaneously serve as emulsifier) at 85 °C and 25 rpm.

Eric Dufour of ENITA Clermont Ferrand, France, characterised various AOC blue mould cheeses (Bleu d'Auvergne and Fourme d'Ambert) by means of multispectrum image analysis for the rapid, non-destructive determination of quality (e.g. maturity stage). UV-VIS-NIR spectroscopy (Multiway Imager) within a band range of between 350 nm and 850 nm, for example, can provide evidence of the distribution of blue mould on the surface of cheese slices, dependent on cheese type and producer.

Mette Marie Løkke of Arla Foods amba (Denmark) presented a paper on the sampling and online measurement of water, fat and protein content in hard cheese. She gave an impressive description of the difficulties involved in sampling and hence process monitoring (Process Analytical Technology), as the dry mass varies greatly depending on the position of the block of cheese in the preliminary press. Online measurement was therefore selected. The water content of every second cheese was determined by microwave measurement, as only the surface is measured in NIR and NMR is still too expensive.

4.8. New Cheesemaking Technologies

In his introductory talk Alan Kelly of University College in Cork (Ireland) described the various technologies used for the pretreatment of milk in cheesemaking. Three aspects are particularly important. Pretreatment should render the milk microbiologically sound, increase caseation yield and make it possible to exert a targeted influence on ripening. Alan Kelly placed special emphasis on high pressure treatment as a pretreatment for raw milk. Subjecting the raw milk to high pressure treatment can increase yield by integrating β -lactoglobulin in the cheese matrix.

Another way of increasing yield was propounded by Richard Ipsen of Copenhagen University (Denmark). In this research project the original milk was treated with phospholipases. This made it possible to increase the yield in mozzarella production without adversely affecting the aroma, meltability or browning of the product during melting.

There are various possible ways of influencing cheese ripening. Byong Lee of McGill University in Canada showed that proteolysis in Cheddar cheese could be accelerated by recombinant aminopeptidase (PepN) obtained from *Lactobacillus rhamnosus* and then encapsulated. Encapsulation of the peptidase meant that less than 1% of the enzyme was lost through the whey during the caseation process.

According to Ana Lucía Penna of São Paulo State University (Brazil), an interesting way of improving the quality of fat-reduced Prato cheese is either to add strains of *Lactobacillus casei* to the milk from which the cheese is made, or to add a proteolytic enzyme obtained from the unripe fruits of *Bromelia fasuosa*.

Joan Miquel Quevedo of CERPTA in Spain pointed out the advantage of subjecting goats' milk to ultra high pressure homogenisation compared with traditional pasteurisation. The main difference here is in the microstructure of the cheese. In cheese made from high pressure-treated milk the fat globules were completely integrated into the protein matrix.



Alan Kelly, Keynote Speaker on New Cheesemaking Technologies

4.9. Cheese as a Food Ingredient

John Lucey of the University of Wisconsin-Madison (USA) gave a very interesting overview of cheese as an increasingly important ingredient in foods, e.g. in garnishing pizzas, as sandwich fillings ("appetisers"), cheese slices in hamburgers and as an ingredient in ready-to-serve sauces for pasta dishes. In the USA nowadays pizza cheese, South American varieties of white cheese and "fromage frais" are increasingly being used in addition to mozzarella, "processed cheese" and "cheese imitations". Of the greatest interest, apart from constituents and manufacturing process, are functional properties such as slicing, shredding and melting properties. Today the functionality of cheese melting and flowing can be dramatically changed and controlled using technological processes. Improved flow characteristics can be obtained by longer proteolysis, a reduction in bound calcium and with higher water and fat content. By contrast, a very low or very high pH value (< 5.0 and > 6.1), heat- and acid-induced gel formation, homogenisation of the milk, subjecting the milk to intense heat and adding a lot of denatured whey proteins results in generally poor melting behaviour. The above statements were impressively supported by so-called "rheograms" (measurements of melting properties using a rheometer, such as also used at ALP). The main point of interest here is the finding that the balance of bound to released calcium changes during proteolysis. Certainly a great deal of insoluble calcium is released at the start of the ripening phase, whereas the influence of proteolysis only assumes importance in a subsequent (second) ripening phase. How else can calcium be removed? A lower calcium value is obtained by the addition of citric acid (lowers pH and has chelate-forming properties). Wash stages during production remove lactose, so that less acid is subsequently produced.

The ripening of mozzarella causes more free water to be absorbed by the protein matrix; this is associated with better sliceability and grateability, improved curd particle consolidation and better melting and stretching properties. If too much insoluble calcium is released, however, a soft, granular texture of poor sliceability and grateability is produced.

How can the keeping qualities of cheese be extended, or even better adapted to consumer requirements in general? It would be ideal if the ripening process could be stopped. A relatively high burning temperature destroys existing rennet and reduces bacteria count. High salt concentrations likewise reduce bacterial activity. The following technological possibilities were also discussed: the high pressure treatment of cheese, the prevention of changes in pH using several curd washes, and diafiltration or the use of salt-sensitive cultures. To obtain the desired texture it is always important to find the optimum balance between attracting forces (hydrophobic interactions, calcium phosphate bridges) and repelling forces (positive or negative electrostatic interactions depending on pH value).

In her lecture Eva Düsterhöft (Nizo, Holland) reported on the trend towards more and more cheese being sold in the form of slices. Adhesion to the cheese knife and individual slices sticking together

after packaging place great demands on technology. Cheese adhesion characteristics also play an important role in consumption. Four different tests were used to measure these adhesion characteristics: "uniaxial compression", a slicing experiment, a "roller test" and tensiometric analysis (contact angle measurements). The demonstration cheeses were analysed and compared with sensor technology. Measurements with the tensiometer, "uniaxial compression" and the slicing test showed interesting correlations with sensor technology.

Rani Govindasamy-Lucey (Dairy Research, Wisconsin, USA) presented the results of trials carried out to investigate the influence of emulsifiers (mono- & diglycerides) on the texture and baking properties of non-fat processed cheese. The problems associated with non-fat cheese, such as undesirable colour changes and stickiness, hard texture and poor melting characteristics, have been known for some time. Compared with the control which had no mono- & diglycerides, during heating and cooling cheeses made with 4% emulsifier had a neutral white colour (no colour change or browning), a softer texture, better melting qualities and a low propensity to stickiness. In the USA these studies and results have led to a patent application.



John Lucey, Keynote Speaker on Cheese as a Food Ingredient

Christina Coker (Fonterra, New Zealand) discussed functional additives in the production of processed cheese raw material and the role of α -s1-casein as a texture transformer. Caseins were enriched by patented procedures and processed into cheese with or without whey proteins. The measured hardness and the melting properties and viscosity respectively increased with the concentration of α -s1-casein in cheese without added whey. In the experiment with whey proteins, however, the melting characteristic was negatively affected.

Jonathan Goodwins (Danisco, France) used the enzyme hexose oxidase (HOX) to improve the qualities of pizza cheese. This enzyme is commercially available and is obtained from *Chondrus crispus*, a saltwater seaweed. In the presence of O₂ the enzyme oxidises reducing sugars. The advantages of this enzyme are as follows: the curd need not be washed to remove sugar, and the pizza cheese can be heated without browning (Maillard reaction) taking place.

HOX is also effective when sprayed onto pizza. The enzyme, moreover, has antimicrobial properties owing to the formation of H_2O_2 . The question is whether this enzyme will gain acceptance in the Swiss cheese industry because of licensing/declaration?

Stefano Cattaneo (University of Milan, Italy) discussed possible methods of quality control for grated Grana Padano cheese. A new method based on centrifuging was presented. Grated Grana Padano has the following specification: cheese produced from raw milk, less than 18% rind, more than 9 months' ripening time and typical pattern of amino acid distribution. The alkaline phosphatase must be detectable in the top part of the centrifugate. The admixture of rind can be established with the aid of specific peptides (ratio of specific fragments of α -S2-casein to α -S1-casein). The ripening period can be determined by analysing the free amino acids (glutamic acid, lysin and similar). Market inspections over the past three years have shown a significant improvement in quality and a significant reduction of low-quality and imitation grated cheeses.

4.10. Packaging

In her keynote paper, Grith Mortensen of the Danish Dairy Board covered the many significant aspects of packaging. Packaging has a major influence on product purchase. Losses from spoilage can be minimised by suitable packaging.

The most important requirements for cheese packaging are: machinability, water vapour-, gas-, light- and aroma permeability and protection, legality (migration), commercial and customer demand, price and availability, and sustainability.

The composition, structure, processing, gas composition and volume of the packaged product must be known in order to be able to define packaging requirements more accurately.

The barrier properties of the packaging material and the CO₂ solubility of a semi-hard cheese determine, for instance, whether swelling of the packaging occurs. Exposure to light and oxygen result in lipid oxidation, but protein oxidation can also occur in non-fat cheese. The crucial factors are light intensity, light wavelength, temperature and exposure duration.

Biodegradable materials such as polylactic acid (PLA) are well suited to cheese packaging. At present excessive water loss is a disadvantage. According to Mortensen, current and future research activity in the packaging field will concentrate on the introduction of active and intelligent packaging. The key words here are RFID technology, absorbers/remitters, technological display, suitable modified atmosphere packaging (MAP), nanotechnology, smart ink technology, coating technology.

The talk by Issam Sebti of the University of Lyon (France) dealt with the incorporation of nisin into packaging film with the aim of preventing the growth of pathogenic bacteria in curd cheese. The integration of bactericidal substances into packaging and not applying them directly into or onto the food is an interesting approach. Action is delayed correspondingly. In the case of curd cheese a significant reduction in listeria was found after 23 days' storage. Legal food issues and efficiency call for precise clarification before such technologies are put into use.

The dependence of protein oxidation on the fat content of cheese was described in a poster presentation. It was shown that oxidation processes under the influence of light cannot be prevented by the absence of oxygen alone (vacuum packing).

The influence of two types of packaging (polystyrene tubs with brine, vacuum-packed Cryovac containers) on the properties of Turkish white cheese was the subject of another poster presentation. As in another Turkish paper, the differences found appear to be caused primarily by the differing salt content of the cheese stored.



Grith Mortensen, Keynote Speaker on Packaging

5. Social Programme

In the social programme, we wanted to demonstrate that tradition and innovation are not contradictory but, on the contrary, that they complement each other. Switzerland in general and the Swiss cheese industry in particular have a lot to offer in both areas. The good attendance and wealth of positive feedback showed us that our message was understood.

Another major aim of the supporting programme was to encourage the informal exchange of views and the development of individual networks. The very lively discussions which took place indicate that here again we were successful.

5.1. Visit to a typical Swiss village cheesemaker

The supporting programme of the 5th IDF Symposium on Cheese Ripening in Bern started with a visit to the Gruyère demonstration dairy in Pringy and a tour of the little town of Gruyère. There was great interest in this event, which was sponsored by the Swiss Association for the Promotion of AOC-IGP. Both coaches were full to capacity with almost 100 participants. On the drive to Pringy those on the excursion were given a short introduction to commercial cheesemaking in Switzerland by their ALP escorts Sarah Keller, Konrad Schlupe, Ernst Jakob and Daniel Wechsler. After an hour's drive the group arrived at the Pringy dairy in brilliant sunshine. Participants were divided into two groups for the tour. In an interesting talk Barbara Pokorny from the AOC-IGP Association first provided the international guests with information about the background, objectives and activities of the Swiss Association for the Promotion of AOC-IGP, explaining the close links between culture, tradition and quality in AOC-IGP products. In the second part of her talk she dealt in depth with the structure and functions of Interprofession Gruyère and then gave a detailed account of the specification requirements for the production of Gruyère AOC. In the subsequent tasting with Jean-Pierre Häni the visitors had a chance to sample Gruyère AOC of different degrees of ripeness. Afterwards they joined an informative tour of the demonstration dairy and took a lively interest in following the production of Gruyère AOC. Before lunch the visitors had the opportunity of taking a refreshing walk through the picturesque little town of Gruyère and enjoying the magnificent view of the Alps. They then partook of a moitié-moitié fondue in the cosy setting of the demonstration dairy restaurant. Before returning to Bern there was also the chance to watch Gruyère d'Alpage being made over an open fire on a platform in front of the dairy. On the return journey the participants expressed their appreciation of the unforgettable trip and the AOC-IGP Association's fine souvenirs with an enthusiastic round of applause. On arriving back in Bern our guests had the opportunity of taking a guided tour of the old town.



Barbara Pokorny of the AOC-IGP Association introduces Gruyère cheese



A walk through the lovely little town of Gruyère was included in the programme



A fondue is a compulsory part of the visit to Gruyère

5.2. Welcome Reception in the Town Hall

The first major event following the excursion to the demonstration dairy in Pringy took place in the venerable Berner Rathaus. Old acquaintances greeted each other and younger scientists were cordially received into the Cheese Community.

After the official welcome by Hans-Peter Bachmann and Ueli Bütikofer of the local Organising Committee, Michael Gysi, the Director of ALP, also extended a warm welcome to the participants from 41 countries (see section 2.6).

The history-steeped location of the Berner Rathaus was a highlight in itself. The gigantic entrance hall with its massive wooden beams and sandstone pillars provided a suitably imposing setting. In a passionate speech the Mayor, Alexander Tschäppät, enthused over the virtues of his city and extended an impressive and witty welcome to the international cheese researchers.

The informal part of the evening was introduced by the President of the Emmentaler Switzerland Organization, Herr Jürg Simon (see section 2.7). Aperitifs were provided by the City and Canton of Bern and by the Emmentaler Switzerland Organization.

These initial pyrotechnics well and truly launched the Symposium's supporting programme. Already everyone was looking forward to the next surprise.



The welcome reception was held in the Town Hall



Animated conversation in a relaxed atmosphere



The Mayor of Bern, Alexander Tschäppät, gives a lively introduction to his town

5.3. Modern art in the Zentrum Paul Klee

On Monday evening, the Zentrum Paul Klee opened its doors exclusively to our Symposium participants with an interest in culture. The unique atmosphere in the three “waves” designed by architect Renzo Piano was enhanced by one of the greatest highlights of the supporting programme – the imposing appearance of Eliana Burki, the Bernese alpenhorn player. She combines this traditional instrument with modern tunes, rhythms and song. It is exactly this combination of traditional and modern which poses one of the greatest challenges in cheese research. This being so, it was obvious that Eliana would meet with enthusiastic applause.

After the first part of Eliana’s alpenhorn performance the guests tucked into a substantial finger buffet lovingly served by ALP colleagues, visited the exhibition centering around Paul Klee’s masterpiece *Ad Parnassum*, and coaxed their first notes from the alpenhorn under Eliana’s expert guidance.



The 3 Musketeers on alpenhorn with Eliana



Modern art, a great atmosphere and delicious appetiser



Flight mechanic Reto Burkhardt introduces the cultural evening



Eliana Burki delights the audience with her music and charm



One or two actually managed to produce a note ...

5.4. Symposium dinner on the Gurten

The climax of the supporting programme was the Symposium Dinner on Bern's Hausberg Gurten. Despite wind and weather all 350 places were booked out. In addition to the Symposium participants of this unique event was also attended by guests of honour from politics, local government, trade and industry.

"Fromarte – the Swiss Specialist Cheesemakers", the evening's chief sponsor, conjured up an incomparable atmosphere in the marquee on the Gurten. The four main regions of Switzerland with their speciality cheeses and other local delicacies were given an inimitable introduction. Each region also contributed a musical offering and Anton Schmutz, Director of Fromarte – the Swiss Specialist Cheesemakers gave a presentation on the different cheese varieties.

The relaxed schedule allowed guests to eat their fill from the four buffets throughout dinner. This created a very informal and dynamic atmosphere, which meant that once again everyone mixed well. A minor highlight was the presentation of the "Swiss Cheese Award" for the world's best cheese scientist (also see section 6). In an stirring ceremony Hans-Peter Bachmann and Ueli Bütikofer conferred the first award on Ylva Ardö. She was tremendously pleased at this mark of recognition and gave tearful thanks to her colleagues, employer and family for their support. In Denmark and Sweden the presentation of the award occasioned several newspaper articles and received radio and television coverage.

In the end the weather even improved, and from the Gurten on their way back down the valley the guests were able to enjoy the splendid view of Bern's sea of lights.



The buffets from four different regions went down well



Anton Schmutz, Director of Fromarte – the Swiss Specialist Cheesemakers introduced the landscape and cheese varieties of each region



There was also a typical musical offering from each region



Barbara Trachsel and Annette Rubin of Republica, our PR agency



Daniel Gagnaux, former ALP Director, with Manfred Böttsch and Michael Gysi



On behalf of everyone Paul Jelen thanked Ueli Bütikofer and Hans-Peter Bachmann

5.5. Agroscope Liebefeld-Posieux Research Station ALP

Around 80 of those attending the 5th IDF Symposium on Cheese Ripening in Bern took advantage of the opportunity to pay a visit to ALP in Liebefeld at the end of the Symposium. The visitors were given an insight into ALP's many varied activities and attractive infrastructure on a specially prepared tour with five stopping points. One of the aims of this tour was to demonstrate to our visitors that ALP is an interesting partner for international research projects. Susanne Marschnig and Karl Schafroth explained the activities and equipment of the model cheese dairy to our guests. Taking Emmentaler AOC cheese as an example, Marie-Therese Fröhlich-Wyder also explained how practical research by ALP has been improving the quality of Swiss cheese over the decades. Ueli Zehntner, Bettina Bärtschi, Walter Strahm, Brita Rehberger, Pius Eberhard and Katrin Schreier used project-related examples to present the great variety of innovative research being carried out in the field of biotechnology and dairy technology. On their tour our visitors also learned about culture production at ALP. ALP's impressive range of cultures vividly illustrates the success achieved by networking between ALP and working cheesemakers. Konrad Schlupe and Elisabeth Eugster used the example of AOC cultures for Gruyère to describe ALP's expertise in developing and producing new cultures, and pointed out the great potential of our in-house strain collection. After visiting the trial units and culture production our guests were taken on a tour of the laboratory block. Time constraints made it impossible to give a comprehensive presentation on ALP's analytical expertise, so only specially selected examples from the analytical sphere were given. René Badertscher and Ernst Jakob talked about ALP's Service Analysis Division. The advisory activities of ALP's cheesemaking consultants were also described using a real-life sample of defective cheese. On their tour of the aromatic analysis and sensory technology laboratories with Hedwig Schlicherle and Patrizia Piccinali the visitors gained an idea of the ultra-modern laboratory infrastructure at ALP. The tour also included a stop at which Dieter Hess, Frigga Dohme and Andreas Gutzwiller briefed them on the infrastructure and activities of the Posieux site. After the rigours of the tour Edith Beutler and her catering team provided a fortifying snack which was much appreciated by all.



The ALP pilot plants caused great interest among the visitors.



Patrizia Piccinali explains the procedure for the sensory testing of raclette



Marie-Therese Fröhlich-Wyder in the radio interview



The tour was rounded off by a light lunch

6. Cheese Award "Best Cheese Scientist Worldwide"

We are very proud to present the Cheese Award to the "Best Cheese Scientist Worldwide". Every two years, the Swiss Cheese Awards are given to the best cheese maker in various categories. Special awards are also given at different times. Thus a few years ago, ALP was able to receive the award for the "Best Federal Dairy Research Station".

The Cheese Award features the "Helvetia". The figure of the "Helvetia" is only indirectly involved with the Helvetians. It was created in the 18th century within the Confederation. The Confederates were classically educated men and inspired to use this allegory to make the connection back in time with the Helvetians. The Helvetia, therefore, stands for our stewardship with regards to our traditions and our cultural inheritance. And that is really the topic of this evening.

The Selection of the "Best Cheese Scientist Worldwide" is internationally very widely supported and involves three stages:

- a review committee – consisting of Hans-Peter and Ueli nominated, acknowledged scientists. It is only an ugly rumor that attractive blonde ladies had an advantage here.
- an examining body – consisting of Ueli and Hans-Peter – investigated in depth the scientific career with the help of a bottle of wine (or two) .
- and finally the academy – consisting of Hans-Peter and Ueli – decided unanimously to whom this unique award should be given. We are very curious who the winner is...

The award goes to a person who like no other has supported the networking of Cheese Science and exchange of knowledge on an international basis. There is surely no international panel of experts within the cheese world on which our winner does not play a major role. Yet our winner is very conscious of the fact that science must not be carried out in an ivory tower but supply answers to important social and economic questions.

Without the winner of our award none of us would be here tonight, since our winner actually invented the Cheese Ripening Symposium and organized the first three occasions with extreme enthusiasm and also in the last months we could always count on her competent advice.

The winner of the Cheese Award "Best Cheese Scientist Worldwide" is...

... Ylva Ardö.



Ueli Hans-Peter Bachmann and Ueli Bütikofer gave the eulogy



Ylva Ardö expresses her thanks for the honour of being voted "Best Cheese Scientist Worldwide"

7. ALP Room

ALP's achievements in cheese research are definitely of international standard. This was amply demonstrated by the talks and poster presentations at the 5th IDF Symposium on Cheese Ripening as well as by conversations with those attending. Most of the participants from abroad, however, were unaware that this is a Research Station with many different areas of responsibility and core competences. This is how the idea of an ALP room or ALP walk came up: an ALP trail on which participants can learn about ALP's core competences at selected stands.

The Organising Committee comprised Marie-Therese Fröhlich, Susanne Marschnig and Karin Wehrmüller, all of whom work in various ALP departments. A side room of approx. 90 m² was made available in the BEA conference centre. During preparations it was decided that participants ought to know more about five core ALP competences in the cheese area: Communication (Monika Boltshauser), Education (Elisabeth Eugster), Research Collaboration (Karin Wehrmüller), Application in practice (Ernst Jakob) and Pilot Plant (Susanne Marschnig). The aim of those responsible for the stands (in brackets) was to convey a clear message about their area of responsibility using not only posters, presentations, informative and illustrative material, but also well-directed decoration.

The stands were incorporated in a mountain landscape of woods and meadows, with birds twittering in the background. It was thus possible to gather information on ALP's core competences on an imaginary walk in a tranquil atmosphere. Not even the souvenir snapshot was neglected (Picture Spot): as a memento of the Symposium, participants were able to take home a photograph of themselves and the cow Lovely, framed by the Symposium logo and, naturally, including Johann.

During the Symposium this area was a sort of oasis where you could hold a conversation in peace and quiet and even sit down to eat your lunch!



Hans-Peter Bachmann explains the ALP range of cultures to Doris Leuthard and Manfred Bötsch



Michael Gysi being interviewed by the Swiss Television news magazine presenter



Barbara Walther in conversation with Doris Leuthard



Alexandre Jacquet of Republica, our PR agency

8. Division for creativity Johann ALP – a legend in his lifetime

Johann, Agroscope's smart and savvy ambassador for the 5th Cheese Symposium 2008, has accumulated a wealth of experience during his short life. He was soon emancipated, transformed from a promotional image into a well-regarded ambassador with an inherent momentum hardly suspected at the time of his birth. Annette Rubin and Alexandre Jaquet report on Johann's rapid progress to adulthood.

The task which Agroscope set us was clear and simple, but none the easier for that. In early 2006 we were approached by Hans-Peter Bachmann, Ueli Bütikofer and Reto Burkhardt of ALP: an international Cheese Symposium was to be held in Bern in two years' time – it would be an important platform for Agroscope which called for the appropriate communications groundwork. In plain language this meant sustaining a conspicuous communicative presence for two years and creating the right frame of mind for the international conference. It was not really feasible to satisfy this remit for such a lengthy period using the existing usual communications platforms.

In our discussions with ALP we soon realised that an identification figure was needed to give the Cheese Symposium a face and an identity. One which maintained an unobtrusive but appealing permanent presence. One able to act as a credible and likeable guide to even the non-specialist content and side issues relating to all aspects of cheese, research and the Symposium. One which was also malleable and capable of development, as well as being able to convey emotionality in a scientific context. ALP needed an independent, virtual ambassador. Thus were the foundation stones laid for Johann's astonishing rise as a celebrity.



Draft: The birth of Johann

Johann's birth

As laymen in the field of cheese research it soon became obvious to us that the only internationally effective cheese ambassador and goodwill figure from Switzerland to fit the bill would be an Alpine herdsman. A man rooted in the agricultural environment. Using this as a starting point the illustrator Ben Sommer developed three basically different herdsman types: a rather gruff son of the soil like a herdsman in a Heidi film, a somewhat gangling herdsman with scientific leanings, and finally Johann, the savvy young whippersnapper. "Right from the start we suspected that in Johann we had created a character type of high communicative potential" agree Annette Rubin and Alexandre Jaquet. "It was one of those gratifying moments when you look at each other and say 'this is it' – and hope the client sees it the same way".

We were fortunate in being able to introduce Johann to a receptive client. At the initial presentation this cheeky alpine herdsman not only won over the Agroscope team straight away, but in addition to his appealing charisma also exhibited a few essential characteristics which made him an ideal cheese ambassador: he conveys "Swissness" in a fresh way, has a dynamic effect as a young, open-minded agronomist, and provides a certain urbane touch. Johann therefore embodies certain innate Swiss character traits: rootedness in the soil, respectability, coupled with open-mindedness and a certain roguishness. As an alpine herdsman he also subtly conforms to the Swiss stereotype of mountains, cows and yodelling cowherds, an image which normally engenders positive feelings in our neighbours near and far.

The roguishness and inquisitive open-mindedness radiated by our fictitious character Johann allowed us to skip over the scientific language without losing credibility. With Johann as sender the way was open for ALP to communicate messages and topics in a complex scientific field trenchantly and clearly in simple language.

With these character traits Johann was ready to enter the world of cheese and win scientists' hearts.

There are many reasons for Johann's success

In the environment of the Cheese Symposium Johann created his own world, and this soon developed an inherent dynamic. Apart from the character traits already mentioned, one factor was decisive in Johann's acceptance and resounding success: ALP immediately accepted the figure as an independent character, adopted it and actively provided it with content. Right from the start he could count on three committed godfathers – Hans-Peter, Ueli and Reto – who were to play a crucial part in Johann's breakthrough. They were equally instrumental in moulding and refining his personality and, like lawyers, defending the character's credibility – both internally and externally.

As creators we took real pleasure from the start in seeing how the Agroscope team had the courage to accept Johann and place

him in a scientific environment. Right from the outset they realised the image and communications opportunities which Johann opened up. "The joy, euphoria even, which ALP displayed at this new team member never ceased to surprise us, and occasionally it even took on some almost worrying aspects – in a positive sense", say Annette Rubin and Alexandre Jaquet.

From the beginning, however, ALP was far-sighted enough to assign Johann a clearly defined place and employ him selectively to complement serious factual scientific communication. This gave Johann a distinctive image as social ambassador to ALP and the Cheese Symposium. This clear communicative division of work between the senders, ALP and Johann, proved to be another key to success. It permitted the optimum variation and communication of a wide variety of subjects to selected target groups. Amazingly, Johann the ambassador also set something going inside ALP and initiated a minor culture change in the scientific research station.

Following Johann's rapid in-house establishment he was ready for his ambassadorial role. In order to introduce him and gradually bring him closer to scientists and the public, we designed Johann's development as a process which continued right up to the Symposium. He made his first public appearance on the Cheese Symposium website, but the ideal platform for bringing him continually to life proved to be the Agroscope Newsletter. Johann also turned up on flyers and programmes, and finally put in a personal appearance at the Symposium – not only in the Agroscope environment. Nor did his qualities as a crowd-pleaser and ambassador escape other organisations and individual producers. So at the Symposium Johann appeared not only on behalf of ALP, other organisations also made use of him in their communications. This meant that Johann's success occasionally threatened to get rather out of control and he had to be protected from over-aggressive questioning.

Johann's promotional image needs monitoring

From the start everyone involved was aware that Johann should not be allowed to become stale or watered down over this lengthy period. Image building therefore had to be actively monitored to protect Johann as an ambassador and preserve and enhance the character's credibility and power throughout. In order to prevent Disneyfication this also meant not using Johann for any over-the-top merchandising. "This was sometimes not altogether easy given the growing enthusiasm, occasionally we had to rein our clients back a little," remembers Annette Rubin with a laugh. Ultimately Johann, with all the freedoms he enjoys, had to remain credible: "Of course, as creators and consultants we also felt a bit responsible for the Johann's character and image," adds Alexandre Jaquet.

Johann's story continues

Originally conceived solely for the Cheese Symposium, Johann has since established himself as a tried and tested communicator and goodwill figure for ALP. Just sending him back to his alp after the Cheese Symposium was hardly conceivable now, so he is still an active and loyal supporter of ALP. In future we will certainly have to keep an eye on protecting Johann from unauthorised use by third parties. A strategy as to how far Johann should and can perform briefs and assignments for other players in the cheese environment remains to be defined. One thing is clear – Johann is a person of great integrity and loyalty and is not to be bought.

As a dynamic ambassador, Johann cannot stand still and rest on his laurels. He will carry on developing. We have already come up with some promising ideas, but cannot reveal them yet. You will, however, be hearing from him in future. "When we were developing Johann we had a crazy time, experienced a lot of pleasure and a lovely enriching client relationship which does not come about every day", agree Annette Rubin and Alexandre Jaquet. "We are very eager to see how Johann develops".

No doubt Johann can also serve as a perfect example of the communications opportunities which open up when clients are amenable to relinquishing their habitual channels and forms of communication, leave room for emotion, let themselves be fired with enthusiasm by an idea, and actively participate in a dialogue to develop it – like our partners at Agroscope.

Annette Rubin and Alexandre Jaquet, Consultants

Republica AG, Bern
www.republica.ch

Johann and the relevant accompanying communication was conceived and implemented by Republica AG, a communications agency based in Bern.

Anyone sitting in a aircraft at 33,000 feet should be able to take pleasure in their choice of destination.

Republica accompanies its clients all the way from the idea to the certain knowledge of having chosen the right destination. We ensure that the products and services of medium-sized to large businesses and organisations enjoy a smooth ride to their customers. In all the essential disciplines. In every direction, through 360°.

9. Final Conclusions

To return to the letter published this year in medical hypothesis, most of you have probably used the linked document in the last "Cheese Inside" Newsletter.

Cheese: Everyday, gourmet or medicinal food?

Everyday

As we have just heard in the previous lectures, aspects of packaging are becoming more and more important, not only for the storage of cheese but also for the ripening process. The technical requirements for packaging material are extremely high. A lot of research has started in the field of nanotechnology and we do not know at the moment what will be possible with this new technique. With the introduction of new technologies in dairies, milk is divided into different products before cheesemaking. New cheese varieties and other dairy products can be manufactured with these new products, but they are also very interesting to the whole food industry. Due to the new technologies important improvements have been made in the texture and flavour of low fat cheese. Could you imagine pizza without cheese? Cheese as an ingredient is becoming ever more important. Previously there only used to be snack crackers with a general cheese flavour on the market. Today you have a choice of many cheese flavour varieties.

Gourmet

What would a real meal be without cheese as dessert. It is not surprising that we find so many cheese specialities all over the world. During the last few days we have heard several talks and have seen many posters about regional cheese specialities. Many of this products are not yet available outside the production country. The quality and safety of these cheese products must meet international standards to enter the global market.

Several cheese varieties have a Protected Denomination of Origin, a so-called PDO, or trademarks. This are two important ways of protecting a cheese speciality against falsification. The selection and combination of new starters and ripening organisms in cheese manufacturing gives us the possibility of creating unexplored flavour sensations. New analytical methods and "omics" techniques give new insights into the complexity of flavour formation.

Medicinal food

Johann said in November 2006, "Soon you'll probably be able to buy my cheese at the druggist's. The pharmaceutical bosses should be getting cold feet..." Milk protein-derived peptides show antimicrobial, immunostimulatory, antihypertensive mineral binding, anticaries effects. Some of these interesting peptides have been found in several cheese varieties. In some of them potent amounts could be quantified. Fermented milk products with probiotic bacteria have been on the market for quite a long time. Now

new cheese products with probiotic bacteria are also available. Cheese = healthy food for healthy people and not medicinal food for sick people. Cheese plays a very important part in nutrition. It is not surprising, therefore, that many national organisations recommend the daily consumption of cheese and dairy products. Fortunately dairy products are not only good for our health, but they also taste very good.

Much work has been done during the last four years, many new results have been published. But as we have seen, many questions have not yet been answered. A lot of research is waiting for us when we arrive home. I hope that you gained a lot of new information during the last days and you had also the opportunity of making many interesting contacts for the future. The behaviour of microorganisms is like human relationships, they accumulate when sharing.

Special thanks to the speakers and the poster presenters, the chairs, the many helpful colleagues from our institute and the sponsors and partners. Thank you all for attending this symposium here in Bern. Hope to meet you soon somewhere in the world of cheese.



Ueli Bütikofer, Head of the Programme Committee wound up the official part of the Symposium

10. Last Words...

When Reto, Ueli and Hans-Peter asked me whether I could help them organize the Cheese Symposium I was not altogether sure what I was letting myself in for. But I felt so sorry for the 3 desperados that I simply couldn't refuse. Today I am very happy that I agreed. The Symposium has been a success and I have made many new friends in the Cheese Community.

Now I am infected with the cheese virus as well and there is no prospect of a cure, so in future I shall be getting in touch every so often with a Cheese-Inside. You can visit me on my new web page www.johannsworld.ch, where you can also sign on for the newsletter.

JOHANN

