

Konditionieren statt kühlen

Immer mehr große Backwarenfilialisten legen sich Vakuunkühlanlagen zu. Dabei steht die Technik im Grunde bereits seit 2000 zur Verfügung.



++ Peter Györgyfalvai, owner of Kuchen-Peter, with vacuum-cooled goods

+ Peter Györgyfalvai, who owns Kuchen-Peter Backwaren GmbH and was receptive to the technology, was the first to enter the domestic market in 2003. He not only bought batch plants but also ordered the first continuously producing vacuum line 2 years later, consisting of six individual chambers. Györgyfalvai, who supplies the Austrian food retail, still uses them today to chill part- and fully-baked products in a fast process, after which he packs them. They are afterwards delivered refrigerated or frozen without a shock freezer or at ambient temperature. With the technology he uses the fact that the boiling point of water also falls as the pressure is reduced. The energy needed for this is abstracted from the product that is to be cooled. The process has a beneficial effect on the stability of the baked products at the same time, and keeps them crisp for significantly longer, thus also preserving a fresh visual appearance.

Györgyfalvai: "Part-baked and white, i.e. really without any browning but with a stable shape – we achieve that by ending the baking process after 10 to 13 minutes and immediately putting the products into the continuously operating vacuum conditioning system. That allows us to carry out the storage and logistics entirely without refrigeration or deep-freezing! The result is a superb quality that cannot be produced more economically or ecologically. A win-win situation for manufacturers and the retail."

In the meantime, since 2012, a new generation of vacuum cooling plants has appeared. Cermak says: "The construction has become more compact, the new pump technology consumes 30% less energy than the old one, and as a



++ Vacuum-cooled part-baked products in the as-delivered state and fully baked

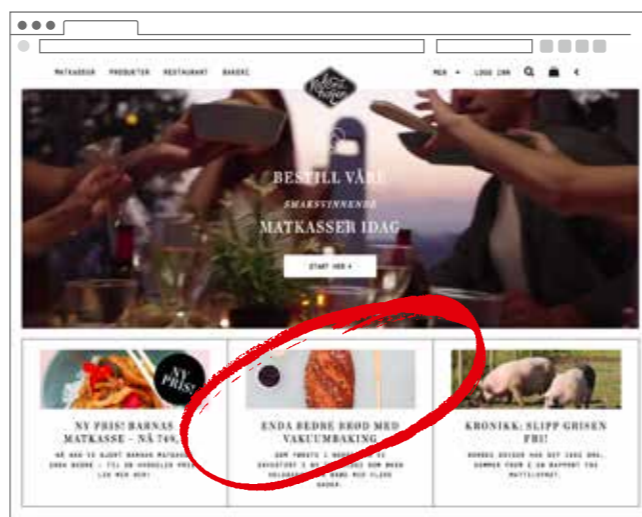
result the noise level has decreased by 50%. The plants are also fitted with an automatic sliding door, so the process is interrupted at the optimum time." In his opinion, however, the factor that is currently causing so many bakers to seize hold of vacuum cooling is not so much the technology but rather the processes, which are aimed much more precisely at the need of the individual product. According to Cermak: "In principle we run with a smaller vacuum nowadays, but we end the process at higher temperatures so we can ensure that finally there is a guarantee of no less moisture, and with some products there is actually more moisture and often, mainly with seeded products, more flavor retained in the product than when using more conventional refrigeration technology. Nowadays it is more a question of conditioning the goods for the respective requirement and less about simple cooling."

The requirement varies greatly. For one chain store operator it is a question of reducing the expensive preparation time in the morning in the widely scattered branches by delivering the first batch of stock in perfect condition from the production unit, while another operator utilizes the long-lasting crispness to get by without baking in the shop. For a third retailer the immediate slicing firmness of vacuum-cooled breads is the decisive argument. Others in turn use vacuum-cooled baked products to save clients in catering and restaurants the need to bake off. According to Cermak, this works even if the goods are stored deep frozen after vacuum cooling. In all cases the electricity bill profits from the fact that the process allows efficient batch sizes without needing to store parts in deep freeze. +++



Organic baker advertises technology

Norway's biggest organic artisan baker advertises that it uses vacuum cooling.



Kolonihagen explains vacuum baking easily
www.youtube.com/watch?v=xJ1SxhEnfao

+ The married couple Katrine and Jon-Frede Engdahl together with Jon's sister Jorunn Engdahl founded Kolonihagen in 2004. They wanted to work for "a better life", which includes organic foods just as much as species-appropriate life for animals and a good, meaningful life for farmers. Bio plus is the name Jon-Frede Engdahl gives to the philosophy of the company which he still manages, even though the three founders sold it two years ago to Rema 1000, one of the country's biggest food retailers.

Kolonihagen consists of a total of five lines of business whose activities are interwoven: a bakery, restaurant, brewery and a delivery service for what are called "green boxes" in Germany but are available from Kolonihagen in various formats depending on whether there is more fruit, more vegetables, more luxury foods or more baked products – everything organic of course. Line No. 5 is rather more unusual. In this division of the company, Kolonihagen develops products for the food retail, from raw materials and processes to packaging. Measured in terms of sales, No. 5 is the biggest part of the company, followed by the manufacture of baked products.

Kolonihagen's bakery employs 15 staff and is thus Norway's biggest organic artisan bakery. There are a few other organic bakers in the country, but they limit themselves to producing baked goods, are smaller, and not many of them also sell their bread through the retail.

Kolonihagen markets its baked products through forty selected food retailers in Oslo. The remainder goes to caterers, restaurants and canteen operators, and into "green boxes".

The bakery commissioned a vacuum cooler from **Cetravac AG** in Switzerland nearly three months ago. The reason for it was quite pragmatic. Production volume had



baking+biscuit
INTERNATIONAL



SPECIAL cetravac
EDITION FOR

www.bakingbiscuit.com



Quiches, Pies, Natas

Versatile and fully automated

AiBi Congress

The new elected President of the AiBi

Vacuum cooling

Conditioning instead of cooling

#1
19



New vacuum conditioning for small chain stores

Cetravac AG is among the most successful suppliers of vacuum conditioning plants for chain stores in Europe. Company founder Adolf Cermak announces new developments for the südback trade fair.

+ brot+backwaren: Mr. Cermak, your company has stood for the use of vacuum conditioning plants in the baking sector for twenty years. How were plants adapted to the baking sector's needs, and what has happened to the chambers, pumps etc. in that time?

+ Cermak: Vacuum technology has been used in food production and in other sectors for decades. The decisive factor when using it for fully or part-baked bakery products is the vacuum generation process, so heat is removed quickly but moisture and flavors are retained. The chambers and their geometry are less decisive in this respect. Cost-effectiveness, benefit and the amortization period are decided by the pumping technology and the experience of our application technologists, who assist customers for many years. Since 2012 we have relied on a very specific combination of pumps, which ensures that our plants consume significantly less energy, and thus cause the smallest CO₂ footprint that is to be found in this application area.

+ brot+backwaren: To what extent can and must control of the baking process and of the vacuum plants be matched to one another to optimize the result when fluctuations occur in air humidity etc.?

+ Cermak: Every baker knows that not only the climate in the proofer and oven but also the air pressure and humidity in the room influence the development of baked products. Some companies attempt to exclude or reduce this influence by actively air-conditioning the production rooms, but this has only limited success because the rooms are never hermetically compartmentalized. That's why experienced bakers include climatic factors into the process controller. When our master bakers start up plants or carry out training sessions, they regularly go through the product portfolio as well, and together with the bakers on site they define the products and weather conditions for which the baking or vacuum process is adjusted. It's not rocket science. As a rule, defining two or three weather variants and the associated control parameters is sufficient. Each baker decides for him/herself whether to change the control parameters in the baking phase or in the vacuum conditioning phase. In most cases, lengthening or shortening the baking process and possibly changing the temperature will be sufficient. Incidentally, our plants can also implement weather-dependent program changeover automatically via an integrated weather station.



++ Adolf Cermak, CEO of Cetravac AG

+ brot+backwaren: Is that one of the reasons why, at least in Europe, there are more batch vacuum chambers than continuous plants? Tunnel ovens can be adjusted only slowly.

+ Cermak: It's not so one-dimensional, of course. The period of time needed to change the process data effectively in an oven thirty or forty meters long certainly plays a part, but it's rather a small part. Another reason may be the fact that industrial manufacturing as a rule aims at a wide

market which the producer can no longer influence after the goods have left the loading ramp. Freezing is the safer way for this situation. Vacuum-conditioned products can certainly last a week or more, but definitely not for months like frozen goods. In that case, however, a rethink is on the horizon in connection with the READY TO EAT® method we have developed. There are also new approaches on the subject of sliced bread that will give vacuum conditioning a considerable boost. Our experience shows that vacuum technology is used more often in artisan businesses because manufacturers, logistics providers and sellers are one and the same company, thus the owners can fine-tune and optimize the whole added value chain together. For major customers, I can take into account the time from the moment of delivery until sale or use, and I can take account of the weather and much more besides. For an artisan business, this differentiated control brings quality and efficiency to a common denominator. Quite apart from the fact that process energy costs are considerably less than with freezing.

Incidentally, the advantages an artisan can derive from vacuum technology also caused us to develop a "Junior Plant" for smaller chain stores. We will also present that at the südback trade fair.

+ brot+backwaren: What does the situation look like with regard to the possibilities of automation in batch operation? Products coming out of a rack oven are transferred into the vacuum chamber by hand, and goods coming from a multideck oven need to be repacked. Is any thought being given to automating this process?

+ Cermak: It certainly is; for example, we are working on solutions to transport trays or entire rack trolleys automatically.

+ brot+backwaren: Your company has sold over 100 vacuum chambers worldwide, most of them in Europe. What is the reason for that?

+ Cermak: It's due mainly to the fact that vacuum plants, as just explained, yield the biggest benefits to those people who have an expert understanding of the entire baking process, and consequently can also undertake meaningful optimizations. If this person is also someone who is in contact with end customers, he/she knows what they want and can respond to it. This situation does not exist in all the world's markets. So it's no surprise that the development of vacuum technology was initiated in European markets that have a strong artisan culture and a well-developed chain store character.

+ brot+backwaren: You began by showing the technology on croissants and bread rolls – is that really still the main area of use, or what else is being sent through vacuum conditioning plants nowadays?

+ Cermak: Small baked goods and fine pastries are certainly still the most important products that pass through vacuum conditioning, simply because then can be "moved around" faster than a one kilo loaf. Otherwise, however, there is a wide spectrum for its use, from toast-bread to a Swiss roll, as well as in the periphery to cool hot-soaked grain, rice, fillings etc.

+ brot+backwaren: You still manufacture in Switzerland. What's the situation regarding service in Europe, specifically in the DACH (Germany/Austria/Switzerland) region? Where

and how do you maintain consultancy capacities in the form of master bakers?

+ Cermak: Production is located in Switzerland and will also remain there, on quality grounds alone. Service also operates via Switzerland in conjunction with national representatives, e.g. the Kövy company in Germany. All the master bakers come from the DACH countries.

+ brot+backwaren: At the iba 2018 trade fair you presented a vacuum oven for a shop – what became of that technology? Are there already any practical applications?

+ Cermak: Der UDO (UnterDruckOfen = vacuum oven) we presented at the iba trade fair in Munich was a prototype that attracted great interest. From it, we have in the meantime developed two variants that we will show at the südback in Stuttgart, a production-ready snack oven – comparable in size with Merry-Chef etc. – and an instore oven. Both operate using vacuum technology, and have the advantage that we completely avoid microwaves, thus bringing the quality of the baked element (pizza crust, baguette halves etc.), to a level that one could only dream of in the past. Moreover, there is no weight loss in vacuum baking, which brings an advantage of up to 10% less initial dough weight.

+ brot+backwaren: Mr. Cermak, many thanks for your time. +++

The other road to success

The range of breads has top priority at the Der Brotmacher GmbH in Klingenberg, Germany. They succeed with this, in contrast to the general sector development, and are also a successful employer.

Köhler's system also includes vacuum cooling, which was purchased a year ago. Köhler says "I compared what was available on the market, then decided in favor of the Cetravac plant." The background to this was firstly the supply of bread rolls to the 21 branches, and secondly the experience that fully baked products do not become "tough" so quickly if they cool down in vacuum. Klingenberg is located in the valley of the river Main, where it is not uncommon for the climate to cause the crusts of bread and bread rolls to lose their crispness quickly. Vacuum cooling stabilizes the crusts. To prevent the crumb losing water, Köhler has modified the recipes and uses even more water-retaining pre-soaked flours than in the past.

Wheat baked products and baguettes, seeded rolls, croissants and pretzel products now entirely run through the vacuum cooler. The result with the three varieties of crusty "Mainwurzelbrot", a specialty bread made from spelt flour whose dough is processed for three days, was almost a stroke of genius. After Köhler introduced vacuum cooling for these varieties, sales shot up more than 50%. Volume and shape are retained better, and crispness is kept for a longer time. That is also true for the wood oven bread and wood oven baguettes, which come from a pellet-heated oven. Both are so sought after that they are currently available almost only by ordering in advance. +++



++ Vacuum cooling gives the range of bread rolls longer lasting crispness

The bakery determines the final quality again

Master Bakers Grobe GmbH & Co. KG has used vacuum conditioning for nearly five years. Final quality is defined by the production unit, and the sales department avoids the hectic morning rush.

+ According to Jürgen Hinkelmann, Managing Partner of Master Bakers Grobe GmbH & Co. KG: "Buying the vacuum plants was one of the best investments in the past ten years." The decisions to do this originated five years ago, after paying a nighttime visit to the Brotmacher bakery in Klingenberg, where vacuum conditioning plants from the Swiss company Cetravac AG were already in use. The rolls and croissants which the Dortmund businessman was able to see there left an impression on him. He is still enthusiastic about it today, and says "The quality was entirely different," and remained so even after bringing them out of the car back in Dortmund. "The croissants were still crisp, and the chocolate chips in them literally floated in the dough, instead of just creating a slimy mess underneath." A breakfast with his wife and daughter in Klingenberg convinced the family of the impression of freshness created by the bread rolls, even after several hours, which led him to present his idea of introducing vacuum conditioning into the bakery to the monthly ERFA (Management Information Exchange) group of branch managers. "We view such decision-making processes rather like a team sport."

The group was skeptical. Until then, the company's own logistics service had delivered all the bread rolls as dough pieces to the Bake-Cafés, where they were put into the oven as required. Some group members thought taking this decision away from the specialist shops was a big risk, while others saw the workload and stress on the sales staff in the early hours of the morning. The decision was for "both at the same time": one half of the demand was to continue to arrive as dough pieces, the other as fully-baked, vacuum-conditioned bread rolls.

Then, six weeks later, came the unanimous recognition by the sales staff that the special bread rolls from the bakery in particular were noticeably better than those produced by the instore ovens. Only special vacuum-conditioned rolls have been delivered to the specialist shops since then, and now muffins, tray cakes, flatbreads and bread rolls for topping, baguettes supplied par-baked, bread roll rings and many other things pass through the vacuum plant. As Hinkelmann says: "I am certain we have not yet reached the limit of our ideas about everything it can be used for."

The vacuum cells have changed the workflows, and are not just additional machines in the bakery. Because the first vacuum plant quickly became a "bottleneck", the installation was enlarged to five rack positions designed as a push-



++ Jürgen Hinkelmann



through plant to separate bread roll production and dispatch. Four racks were also added to enlarge the range of ovens. The combination saves time. According to Hinkelmann: "Nowadays we need 40 minutes from vacuum cell to order-picking. Since then, the entire bread roll production operation has started one and a half hours later." The dispatch operation also needed to be re-planned. Where previously there was space in the delivery truck for 36 boards, nowadays there are thirteen baskets with fully-baked, vacuumed bread rolls, i.e. one third fewer products.

Hinkelmann arranges for Cetravac's master bakers to visit twice a year to train the bakery staff, to optimize applications and to develop correct procedures to expand the product range. "As a rule, we alter the baking program, not the vacuum cells controller, when the air humidity and temperatures change." Equally important, perhaps, is the fact that the bakers identify with the system that has given them back the ability to influence final quality. Hinkelmann: "Nowadays, we have process reliability that is close to the optimum."

There are no longer any complaints about soft bread rolls, either from their own specialist shops or from major consumers. According to Hinkelmann: "Vacuum conditioning has also proved a blessing for Sunday bread rolls. On Sundays, we must supply just as many products in a shorter time, and just as good quality as on weekdays, and that would be significantly more difficult than without vacuum."

+++