

# Change is inevitable

**STANLEY P. CAUVAIN** IS ONE OF THE TWO MEN TO WHOM THE EBERHARD PAECH-AWARD WAS GIVEN THIS YEAR FOR THEIR SERVICES TO THE BAKING INDUSTRY. HERE HE IS IN CONVERSATION WITH EDITOR-IN-CHIEF HILDEGARD M. KEIL DISCUSSING THE PAST AND FUTURE CHANGES IN THE INDUSTRY



**++ figure 1**  
Stanley P. Cauvain received the bronze statue for the Eberhard Paech-Award in October 2010

**+ Keil:** 50 years in the baking industry – that's a long time! Looking back, what do you see as the most important changes in production engineering and technology over the decades?

**+ Cauvain:** Inevitably the major changes in the last 50 years have been associated with the increased industrialisation of baking processes. This has been driven in part by changes in the nature of the basic raw material – wheat, in part by the drive for more consistent end-products and in part by the need for improved economics in processing. The need to deliver more consistent products and improve process efficiencies has often been in response to retailer pressures and changes in consumer shopping habits. There have been many individual engineering and technological changes but perhaps the biggest changes have come about as the result of greater understanding of how baking works and how to control product quality to meet specific end-product needs. It is the increased knowledge of baking that has driven the

technological changes associated with all aspects of baking and its increasing globalisation.

**+ Keil:** Can one say without reservation that all these changes have improved the quality of the end-products or are there one or two things which in your opinion, with regard to product quality, it would have been better not to have introduced?

**+ Cauvain:** Change is inevitable and one hopes that it is change for the better; in most cases that is true for baking and ultimately the consumer. There are strong arguments put forward that many of the technological changes associated with the last 50 years of baking have reduced the craft of bread baking and in particular the introduction of rapid (no-time) dough processing methods has reduced bread flavour. However, such comments do not recognise that baking has always been and undoubtedly always will remain an evolving technology. Modern breadmaking is capable of delivering a wide range of bread types and flavours and it is

for the consumer to decide which product flavour profile and texture that they prefer and it is for bakers to find ways of consistently delivering those requirements.

**+ Keil:** The available range of raw materials has also changed markedly in the past few decades. The protein content of wheat is high in the majority of producer countries, and is on the one hand the result of breeding and on the other a direct consequence of nitrogen fertilisers. In your opinion are such protein contents at all necessary for the baking quality of the wheat, or is there a need for an economic and ecological reassessment of late nitrogen fertilising?

**+ Cauvain:** In some ways the constant drive to increase the protein content of wheat has been misguided. The key to successful breadmaking has always been a case of matching flour qualities with the most appropriate recipe and processing technology. It has taken a while for this relationship to be sufficiently well understood and for wheat breeders to respond accordingly. We are already seeing more targeted applications of nitrogen in the field which is reducing usage levels and this trend will certainly continue.

**+ Keil:** In more and more countries there is a demand for sustainable production – do you foresee consequences affecting the baking industry regarding the choice of raw materials and/or requirements applying to raw materials that will necessitate adjustments to existing process technologies?

**+ Cauvain:** Sustainability of production in the face of increasing pressures on raw materials and energy supplies will provide baking with some of its greatest future challenges. Energy inputs into the process of baking are significant with 60+% of energy used in a bakery being used for proving and baking. As energy costs increase and availability becomes stretched then we must develop more efficient ways of baking if as an industry we are to continue to make a major contribution to the world's need for safe and wholesome food.

We also need to find improved ways of reducing wastage in the grain chain. This means more efficient farming, storage and processing practices so that we can get better 'yields' from our raw materials. Waste reduction remains a priority both for the baker and the consumer.

**+ Keil:** Salt content in bread – the requirements for a reduction have largely been met in Great Britain, but bakers in Germany are blocking a reduction in salt content because in their view the bread then has a bland taste and because they say salt is also a technological necessity. How do you assess this topic; will it change recipes in the long term, or is it just one of the many 'food fads' that will quickly lose importance?

**+ Cauvain:** The contributions that salt makes to bread flavour and fermentation has been appreciated by bakers for many years but it is only more recently that as salt levels have fallen that its contribution to dough processing has been brought sharply into focus. The significant contribution that salt via bread makes to daily consumption and the benefits of reducing one's intake of salt are not disputed but the risk that loss of flavour in bread may reduce bread

consumption is one that should be taken into account. Bread contributes significant health benefits associated with fibre and these should be taken into account in the 'salt' debate. The increasing medical pressures for dietary salt reduction have been around for over 20 years in the UK and worldwide awareness of the concept is increasing; this is no 'food-fad' and we bakers have to engage in sensible debate and will undoubtedly have to make some compromises so that we can continue to deliver nutritional benefits and sensory pleasures to bread-eating consumers.

**+ Keil:** There are great advances in bread and baked products worldwide. New industrial production capacities are emerging in the Arab countries, in Africa and in Asia. Is a demand for mass-market products such as toast, baguettes or buns becoming apparent here, or do you expect it will also be followed by the development of specialties, a market for frozen baked goods etc.?

**+ Cauvain:** Greater travel opportunities and awareness of global markets have increased the diversity of baked products commonly available in any given marketplace. In addition the consumption of more bakery-based products 'on-the-move' (e.g. sandwiches, wraps) has provided new opportunities and markets for bakers. In order to exploit these opportunities bakers need to access a range of technologies beyond those traditionally associated with baking, e.g. freeze-thaw technology. The adoption of process innovations should not be seen as devaluing baking but rather as providing a basis for sustainability for many bakeries and access to new markets and consumers.

**+ Keil:** On the subject of frozen baked goods, the trend in the past ten years has been towards ever higher levels of finishing, including part-baked products that only need baking-off, or even thaw-&-serve technology in which the finished product is at most heated up after being thawed. In Germany and the Netherlands we are now seeing the emergence of bake shops advertising that they "bake fresh". Although they purchase deep-frozen doughs, they proof and bake in the shop. Do you see a growing trend here?

**+ Cauvain:** Part-baked, frozen part-baked and frozen fully-proved doughs have been elements in the baking scene for some while and there have been modest increases in their use. It is worth remembering that many such products are ►

### Stanley P. Cauvain

Director and VP R&D activities

**BakeTran Knowledge & Solutions for the Baking Industry**

[www.baketrans.com](http://www.baketrans.com)

+ Honorary President International Association for Cereal Science & Technology (ICC)

+ Fellow of the ICC Academy

+ Joint Editor-in-Chief, Quality Assurance and Safety of Crops & Foods

+ Awardee of the Eberhard Paech-Prize +++

being used in non-traditional bakery environments (e.g. fuel stations) where bakery offerings in the past have been absent or less than fresh at the time of purchase. The arguments for the classification of bake-off products as being fresh or not are complex since the characteristics of 'freshly' baked bread are many and varied. While appreciating the purist views of many bakers I worry about the basis for their objections. If they could win the case that part-baked bread is not fresh then would it make any difference to their businesses or sales? Surely it would remain just as convenient for the consumer to shop in the fuel station whether the bread bought was described as fresh or not?

**+ Keil:** You and your colleague Linda Young run BakeTran, a consultancy business that is very much in demand internationally. What are the essential problems that are brought to you?

**+ Cauvain:** Many of our consultancies are associated with the desire to increase the level of understanding which needs to be applied to baking and the application of that understanding for quality optimisation, product and process development. All of baking is governed by a series of 'rules' but because of the ingredient-recipe-process interactions are complex so are the rules and they are not always well defined. The key to bakery applications lies with structured observation and systematic processing of the available information. Some of the necessary knowledge comes with experience but we have also developed new ways of assembling, using and passing on some of the required knowledge to others. No matter how long you have worked in the baking industry there are always new challenges to face and that is what keeps us interested, active and in demand.

**+ Keil:** Only a few countries in the world have accredited training opportunities for bakery employees. That is as true for management staff as it is for those working in the bake-house. Will this problem be manageable through more automation, or must the industry worldwide make efforts to offer more training?

**+ Cauvain:** While I am sure that bakery automation will continue to increase, the need for appropriate bakery skills will remain with us for many years yet. The key word in the previous sentence is 'appropriate' and I would suggest that in many countries bakery education has failed to adapt quickly enough to provide courses which fit the industry needs. In part this is because the focus has remained firmly on the craft rather than the technology and certainly not the science. Baking requires a mixture of all three disciplines, that is how I was taught about baking in the past, sadly the level of baking science and technology taught today is not as good as it was 50 years ago.



© Stanley P. Cauvain

It is difficult for many educational institutions because they have to fit into an academic framework that is often inflexible and the demand for bakery employee training is not always well defined. I suspect we will increasingly see more in-company training but this will probably only apply to the larger organisations and may not benefit smaller companies. The problems of bakery education are many but this should

equally mean that the opportunities for new training initiatives are plentiful, however, training organisations must learn to be adaptable and not become bureaucracy-bound.

**+ Keil:** The number of research institutes dealing with cereals' technology and its application in the baking industry has not exactly increased over the past few years either. Do we know all there is to know on the subject, or are we neglecting research?

**+ Cauvain:** Yes we are neglecting cereals and baking research. We certainly do not know all we need to know; each year our primary raw material (grain) is likely to change to some degree and we have to adapt our technology accordingly. In addition if we are to deal with issues such as sustainability and delivering food security for all it is clear that we need to develop new technologies to help us achieve such objectives. There are many contributing factors behind the 'decline' of cereals and baking research institutes which include the reduction in support from government sources as the focus for financial support shifts from one fashionable topic to another. Of course it is easy to be critical but surely if we are to meet future food production demands then we need long-term, sustainable research strategies.

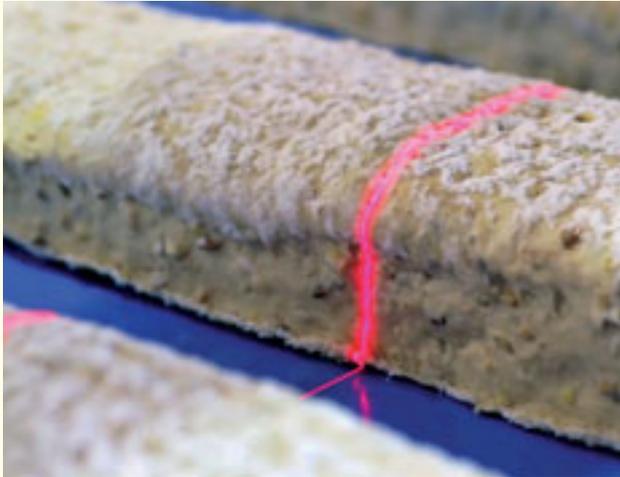
**+ Keil:** There is a European network of existing research establishments but no central European baked goods research facility. Do you think there is a need for one, and if yes, what might it look like?

**+ Cauvain:** With a limited history of support for applied research, now is probably a good time for an integrated research and technology facility for the central European region. Any such organisation would need to find a good balance between applications and research and would certainly need to be equipped with training bakeries and laboratory facilities. The latter should focus on raw material and product evaluations rather than trying to become involved in basic research; there are existing (though diminishing) sources that can be accessed for fundamental research. Whether the current economic climate would allow such a development to take place is questionable but with more states joining the European Union maybe this is one concept the EU could provide support to.

**+ Keil:** Dear Mr. Cauvain, thank you very much. +++



WP BAKERYGROUP



tammen.de

# Scanning. Dividing. Decorating

Machines for the entire bakery process. Robot Technology for dough make-up. **WP DELTA CUTTING ROBOT**. High dividing weight accuracy and precise decoration cuts. Secure in the knowledge of attaining identical results again and again. Your dough in the best hands.

Read more!  
[www.wp-laminating.com](http://www.wp-laminating.com)

think process!

