

## **EQUIPPING THE BAKER IN THE 21st CENTURY**

**David Marsh**

Thank you Mr. Chairman.

Good morning ladies and gentle-men.

In broad terms your markets are static, the bulk of what you produce is now termed com-modity rather than a product that exhibits quality and added value.

Profitable sector growth in our industry is left to niche products in niche markets and those areas with geographic oddities.

Despite efforts by your major manufacturers to increase, quality, and add value and raise margins the average price of bread on the supermarket shelf remains the same whilst the cost of manufacture has only also been stabilised through increased automation of existing processes and rationalisation of manufacturing locations and their overheads, (i.e. bakery closures).

Those are the views of investment analysts outside the bakery industry.

Many here who are determined to talk up our industry would disagree, they would point to those companies that have shown growth and produce high quality, often well branded products bringing significant profitable returns. They would be right to do so, but the maths and economics of the UK market has not changed. Per loaf of bread for sale on the supermarket shelf we have worked harder, worked longer, paid ourselves and our employees less, invested less in our future and made less profit for our shareholders than equivalent bakeries in Continental Europe as may be found in Holland, Germany, Belgium, Scandinavia, Austria, Switzerland and yes even the emerging industrial bakery sectors of France.

So what has this got to do with equipping the baker for the 21st century?

Well the supply side industry can only equip those bakers who have the funds to invest in the development of new machinery and processes that may be on offer. And lets face it, the richer and more change related the baking industry is, the more active the supply side industries are also.

So given that our crystal ball is equipped with a certain amount of rose tint, how can we equip our 21st century baker.

Over the last 2 decades the bakery industry has seen increased investment in plant automation as part of a drive to reduce the man hours per loaf, reduce wastage, increase efficiency and output capacity per plant. With few notable exceptions this has been carried out as part of a rationalisation program within the industry where production is being concentrated in fewer higher capacity manufacturing units.

But lets look at what automation has achieved.

There exists today plants where output capacities of over 7000 loaves/hour are administered by only one operator during the main production cycle, or where 3

operators, 1 supervisor and 1 technician look after production to post cooler of 2 lines totalling more than 14,000 loaves/hour capacity.

Standards of control and measurement have been for some time well able to fully automate all the ingredients required for most products.

Fully automated handling of tins, lids, straps and trays allows the use of larger, heavier, slower moving straps than could be contemplated previously. Removal of manually incurred strap damage has increased productivity and strap life by reducing wear and tear.

Machine cycle times have been reduced to manageable rates compatible with reliable operation. Simple yet accurately engineered lid and strap storage machines allow multiple product changes with minimum strap related product delay.

Total plant concepts reducing the number of contributing machines tend toward greater reliability, so called track plants are an example here, also machines such as spiral coolers and provers.

Remember, however that one machine is only more reliable than two series machines when it is designed and built to the same standard as the two it replaces.

Reliability is the key word here, any plant automation that is not inherently robust and reliable in design, manufacture and operation is not automation worthy of the name. How many bakeries do we know of where an operator has become minder to a piece of equipment because it functions incorrectly, unreliably or the design has left out one small essential operator function.

To an equipment engineer to see this is much the same as a baker witnessing the continued production and sale of substandard bread! To a senior management employee it is treble expenditure! On the initial purchase, the operator costs to compensate for the fault and final cost of correction.

The pace of automation is set and plants installed that do not include it or allow for its future addition penalise the future prospects of the company running it.

SCADA (means supervisory control and data acquisition).

In fact we presently use such systems predominantly for their data acquisition abilities.

Rarely leaving the most simple of artificial intelligence to make supervisory decisions. Fully automated plants demand SCADA. Not only from the point of machine performance analysis to control and maintain its functionality with rapid fault analysis and repair advise, but also from the view of product monitoring and eventually production programming scheduling.

Typical SCADA packages sit on PLC networks looking at PLC data tables and interpreting what they see in graphical and tabular form to the user. If the report structure is properly designed this

empowers the user with critical information on the plants efficiency, capacity and history. Linked to maintenance and fault diagnosis systems it further contributes to the rapid detection of forth coming problems and provides a route to their solution.

It is SCADA where the greatest growth is easily foreseen. First it has to be accessible to all and this can only be when all machines have a sophisticated control interface, like a PC or PLC.

Added to this PLCs of different manufacture are still not conforming to a basis industry standard to allow SCADA systems to sit on their networks and across networks without some additional specialist work. They are usually added by third party suppliers purpose built and designed with many man hours required to design new graphics and often including purpose built software when undertaking anything other than the simplest of production scheduling such as for example a mixer work sheet.

Similarly there is not an industry SCADA standard to allow easy integration of machines into any SCADA system.

When I attach a new printer to my PC it tells me that there is a new printer there. The PC searches for driver software for the printer and if it can't find it, it asks me to insert the disk provided. On doing so all data required to use, repair and schedule my printer is uploaded to the PC for my use.

SCADA standards and equipment packages should so be similarly equipped for the 21st century baker such that adding a new mixer to the SCADA system is no more difficult than plugging it into the network socket and loading the mixer driver software onto the main PC.

With everything talking the same language. The SCADA will be truly available and usable to all.

In Continental Europe plants rated at 2000 loaves/hour or even roll plants rated 12000 rolls per hour/max (or plants capable of both) are often fully automated returning the same efficiencies, reductions in waste and operating margins as much larger plants, but then they have the initial profitability to invest with and show greater rates of return with don't they?

However with time, automation may work its way down to similar sized plants in the UK. Possibly where common machines can function across several production lines without operator supervision. (We already have multideck ovens capable of processing many different products simultaneously as well as several rack loading and handling systems that can be used to automate existing lower speed production plants).

In our drive to reduce the operator needs some times we seem to forget the number of hygiene staff required to keep the plant clean. Wet cleaning systems are not common in the UK bread and morning goods industries although they are more common in high risk readymeals and pizza base bakeries.

Automated cleaning is presently restricted to some sophisticated floor scrubbers (that cannot access the floor under most conveyors). Spiral provers and coolers are usually equipped with belt washers and industrial dough mixers can be equipped with some facilities for wash down bowl cleaning.

Hygiene in the rest of the bakery is typically carried out with mop and bucket technology in the dough processing areas and dustpan and brush elsewhere.

Whilst great strides have been made in hygienic structural design of conveyors and machines, our methods of actually cleaning them has not changed to the point where on some fully automated plants day time cleaning staff outnumber the actual plant operators. Further we continue to foul our plants with either excessive use of release oils (sprayed into hoppers, tins and onto some conveyors) or dusting flours (to provide a dry nonstick lubricant for certain dough make up processes) some of our plants use both! Recent advances in tin coating are replacing the use of release oils and emulsions, this is set to continue hand in hand with automated tin handling processes that care for the strap or tray and its coating.

Hygiene has come to the fore in bakery equipment design over the past decade.

However I would be bold enough to say that we on the equipment supply side of the industry have merely corrected the obvious ills.

Wet cleaning is already common in the United States and whilst we may sigh at the prospect of having to don rubber boots to walk through our bakeries and grumble at the cost to provide a rapid floor drainage system to clear the floor of dirty detergent ridden water, strong hints of this future development appear in the crystal ball.

Future generations of plant will not only be designed for economy of cleaning but include the method of cleaning built into the equipment. Your customers will demand the highest levels of hygiene and as one media scare story hypes up the anti after another, so will you be equipped. If you are profitable enough to afford it hat is!

If there were only one aspect of the equipment story that we as a UK bakery industry could show the rest of the world, it would be our attention to safety and access guarding of our bakery plant!

We have not relied on warning labels or the ability of our operatives to read or exhibit a permanent state of common sense. The UK bakery industry safety philosophy has long been one of if it can happen one day it will happen. Accidents still occur, mistakes are still made, vigilance is ever required by those of us responsible for safety in our bakeries and in the design and manufacture of our equipment.

As we adopt the safety standards accepted under CE legislation so we should be aware of the effect on the standards of safety used until now. Little has changed in the last 30 years with respect to the bakery process. Many would disagree with such a statement. Yet we still mix dough, divide it, mould it, prove it for 55 minutes in a tine or on a tray, bake it for 20 to 30 minutes and then cool it prior to (in the main slicing it) and bagging it.

Over 30 years ago Chorleywood bread process started a seed change in mixing technology allowing high speed automated dough production eliminating massive dough rooms with labour intensive fermenting times. At the same time continuous mixing came and went. Since we have eliminated 1st provers in many plants and re introduced them more recently in others.

Considerable work has been carried out on baking technology to reduce time for white tinned and lidded bread by a few minutes. Vacuum cooling raised high hopes of significantly reducing work in progress during cooling. It has not been widely adopted by the bread industry whilst it shows promise in other bakery sectors.

Most significant recently have been developments to reduce cooling times on bread products using refrigeration to condition and maintain air humidity and temperature.

We seem to miss truly radical attempts to revolutionise the industry.

One attempt has been made at radical change to how bread is made and sold, namely the Milton Keynes process. Is it a blue print for the future? My crystal ball is unclear on the subject, but I believe that it is developments like Milton Keynes process that blaze a path into the next century and beyond. It seemed a pity to me that a bold attempt to change the perception of bread manufacture and marketing was met (in the main) by a debate on the definition of fresh bread! And the future for process development? Radio frequency and microwave heating techniques could come to revolutionise the proving and baking of products. At present 28.8 Mega hertz radio frequency generators (and higher) of any power rely on ancient valve technology or expensive multi banked low power devices, However solid state high frequency high power transistor and thyristors are under continued development.

This technology could radically reduce proving and baking time to a fraction of what it is now. It could also be used to make a whole new generation of bread products.

If the pundits allowed it to be called bread that is. But the biggest change will surely come in the materials and ingredients we use. I will confess to very little knowledge of this area, therefore my crystal ball is here unfettered by reality.

The use of enzymes (little workers) in our additives to configure a dough and crumb structure of our choosing, the continued development of genetically modified ingredients to not only favour the farmer but the baker and maybe even the consumer in terms of easy slicing or lengthened shelf life. Super yeasts could dramatically reduce proving times, enzymes might be programmed to develop certain dough structures. Of course GM is a non marketable product now and it may always be. But that does not mean that the inevitable march toward its financial benefits will not occur in time. Our industry manufactures and successfully markets long life (stay fresh) bread now, but does the average consumer know that we have basically sprayed a loaf with potassium sorbate to make it so? Or does our consumer believe that it is all down to the foil bag.

The title of the talk was indeed equipping the baker for the 21st century. As an employee and dare I say representative of the equipment manufacturing side of the industry I would be expected to stand here and talk about equipment and the brave

new world ahead based on the machines you can buy and we (on the supply side) can provide, and indeed I have! However our 21st century baker must be mentally equipped to deal with the future. The pace of change in our world has been accelerating at a phenomenal rate over the past 30 years and is set to continue so into the future. Maybe the basic baking process has not changed so radically yet, but your markets are changing, life is getting faster, we all require skills far beyond a simple draft in order to prosper. Attempted preservation of past securities can prevent a happy prosperous future.

To use an automobile analogy it is stuck in forward gear and the engine cannot be switched off or stalled. I would encourage us all to reach for the steering wheel rather than concentrating all our efforts on the brake. Take control of your margins, your prices and your costs and then invest in the 21st century. Then the future will be in your hands!