Baking innovation in Australia
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It's a great privilege to be here at the 40th anniversary of the BSB, which has seen so many changes in our industry since its founding.

The anniversary also happens to coincide with my venture into the real world of baking after bakery school. I must say that I mourn the passing of establishments like the Lyons Corner House, where I gained some valuable experience.

It is also 40 years since an enterprising Australian first developed a unique concept of baking which has been so successful in the form of a compact biscuit oven.

The initial innovation has been developed, over the last few years, into a fully fledged manufacturing process. The company is also Australia's only manufacturer of biscuit making equipment and now of multi-purpose compact systems.

Innovation in baking processes in general during the last 40 years has seen rapid developments in convection ovens, rack ovens, spiral ovens, vertical ovens and so on. The choice is considerable and the applications extensive. However, the concept that is of special note in Australia is the serpentine baking system.

The principle of this oven was initially based on the use of narrow trays carried between two chains. These were transported horizontally via sprockets to rise in alternate directions through a series of heated electric elements. Hence the name 'serpentine'.

The initial oven was a very compact unit with a capacity of 35kg of cookies per hour and has been successfully used in in-store bakeries or specialist cookie outlets in over 40 countries.

The oven provides the in-store unit with a constant supply of hot cookies and biscuits and attracts potential customers. There are over 60 franchised Cookie Man units in Australia alone, as well as Europe, South Africa, Asia and America.

The system is based on central manufacture of cookie dough which is boxed frozen and distributed frozen to outlets in shopping malls and elsewhere. The dough is defrosted as required to make fresh baked wire-cut biscuits to service the outlet.

The success of this system led to larger units being produced and a range of ovens have been made which can now produce up to 500kg of biscuit per hour.

Rotary moulders and compact coolers have been added to the process, which still enables reasonable capacity to be contained in a small area. The ovens are electrically heated and very efficient.

The process does not compete with the large scale automated biscuit lines. It's more associated with speciality biscuits and cookie production. A very successful system based on larger ovens has been operating in Scotland for a number of years baking shortbread.

The success of this system was initially in Australia and then its 'home territory of South Fast Asia. The massive growth of the economies in this region, 5-10% per year, continues to provide a significant market opportunity.

I have recently returned from a trip to South Fast Asia and Australia. There is significant development in the snack cake business and long shelf life products in Malaysia, Thailand, the Philippines and Thailand, to name but a few, and now Vietnam.

The countries of the region are changing their eating habits to Western food at an alarming rate. I understand there are 500 franchises for Pizza Hut in Thailand alone.

However, it is the appetite for cake products which has really stimulated the further development of this process. This also includes the massive American market which is waking up to the opportunities on new ambient cake products.

Approximately three years ago, the first of a new generation of ovens was conceived. This was to make a range of muffins and snack cakes at 8,000 per hour and was successfully installed in Australia. This was quickly followed by a mince pie and jam tart baking system with a special product feed system, and earlier this year a snack cake line for Malaysia.

I would like to spend a short time discussing the baking concept of the oven in more detail. The trays still pass in a serpentine manner through 10 layers of baking. Each layer is independently heated and controlled by an Alan Bradley touch screen and PLC on the larger ovens. This is very effective and adjusts temperature quickly as required.

The system will show the actual percentage of available energy being used at each layer. This gives a very clear indication of the rate at which the product is absorbing heat. It is also an additional measure of process efficiency.

The process is capable of condensing the capacity of a 50 metre x 1 metre band oven into five metres. The cooling process also uses a similar serpentine system and is part of the circuit.

There are no products of combustion and the oven bakes on a rising heat profile. Baffles can be introduced to control heat and moisture movement if required.

While the oven is electrically heated, the thyristor control system switches power on and off as required. A figure of 0.5kW of electricity per kg of product baked has been consistently recorded. The heat control is very accurate and responsive.

The connected load on larger ovens can be above 300kW. It is for this reason that an alternative heat source based on thermal oil radiant heat plates has been developed and the first system is being installed in 1996.

The latest installation of the process has been in Malaysia, as I said before, where the line is producing 12,000 muffins per hour. American Twinkies and Australian Lamingtons are also produced on the plant. I have recently prepared a product development matrix for this line showing 90 possible product variations.

The first part of my video presentation shows the Cookie Man franchise operation. It is a bright and welcoming layout which draws the customer to the smell of the baked biscuits.

The oven is fed by a small wire-cut unit which will require little attention and therefore allows one to run the system easily.

It is easy to change from one variety to the next and process a constant range of fresh product. The gift pack presentation is also important to these outlets and provides an attractive high value sale for special occasions.

The next part of the video shows a larger oven producing speciality ginger-bread men from a rotary moulder. The baked product is transferred to an ambient cooler.

The wire cut process has been adapted on the next line to allow two rows of cookies to be baked on the same tray. This is a well known UK product produced in high volume on band ovens. However, the product volume was likely to be considerably lower in Poland. The medium capacity biscuit lines were installed and are producing a commercial volume of the UK product in a very compact area.

The last part of this presentation shows the muffin line on operation in Kuala Lumpur, Malaysia. I think this must be a first. It's a green coloured muffin called pandan - a local flavour speciality.

Larger trays are used to pass down an infeed conveyor with grease application and depositing. Paper cases are placed by hand at present. The trays pass into the oven, which is again very compact.

The full length window makes the process very 'baker friendly' and provides a total visual check on the bake performance.

The touch screen allows the operator to call up and control the total process. There is also a constant record of stoppages and downtime. This can be downloaded via modem to Australia for advice if required.

The flash cooler will remove approximately 30c of product heat and the trays pass on to a pre release vacuum unit. The final cooling is a double layer system and includes ambient cooling at the lower level and chilled cooling above. The total cooling time is about three times the baking time.

The cooled product moves into a specially designed temperature controlled finishing room to be removed by a vacuum pick and place system. A product injection process can be installed at the last stage of the process before transfer using an indexing motion.

The final transfer passes the product to a system of conveyors that can be removed and a finishing unit introduced. There is a final icing, cooling and setting tunnel if required. The last stage is flow packing.

This is an exciting manufacturing concept which enables a lot of production in a small floor space. The application is ever-expanding from the small biscuit concept that started the business. Flexibility and compactness is the key to the system's growing success.

It is a real challenge for any business in the baking industry to take on the tried and tested systems used to manufacture bread, biscuits and cakes.

However, it is my experience that the Australians more than meet that challenge and are prepared to tackle the world. The Auto-Bake process will continue to expand into new product areas.