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## **MAP IN THE READY MEALS INDUSTRY**

Ready meals are one of the bigger successes of the food industry in modern times. But while they have brought major changes to a nation's eating habits, perhaps they would not have been quite as successful had modified atmosphere packaging not been invented. Here an expert in the field, ANTHONY PENN, chairman of Packaging Automation Ltd, the United Kingdom's leading manufacturer of heat-sealing machinery, looks at some of the benefits MAP can bring to the ready meals market.

Modified atmosphere packaging (MAP), has become an indispensable technique for a whole range of packaging needs. Most experts in the field, myself among them, would argue strongly that MAP has been the single most important development in modern-day food packaging.

The idea that food of all kinds should be capable of longer preservation, better taste qualities and have a more attractive appearance is one, which has been around for decades. Many attempts were made to generate improvements, with varying degrees of success. But it was not until late last century that technology and an innate desire for something better finally led to the right blend being achieved.

Enter MAP, and just in time to provide a boost to the ever increasing demand for improved living standards, coupled with the building of transport networks capable of speeding food from source to store. It quickly became one of the success stories of the packaging age as the clamour grew for fresh, chilled food and the like to 'feed' the appetite of a nation with new and changing lifestyles.

So how did it grow into the phenomenon it is today? And what are the benefits it can bring to a whole range of packaging needs?

Quite simply, and as its name implies, MAP is food packaging in which the earth's normal breathable atmosphere has been modified in some way. This modification is usually combined with a lowered temperature, which means it is a highly effective method of extending the shelf life of a wide range of foodstuffs.

In the UK MAP mainly involves the use of three gases – carbon dioxide, nitrogen and oxygen – although other gases are in use around the world. Products are generally packed in combinations of the gas trio, with the mix dependent on the physical and chemical properties of the food.

Perhaps nowhere can rival the UK in its extended use of MAP. Food producers here have taken to the technique in droves, with the logistical, demographic and cultural structure of the British Isles making them so ideal for MAP use that few companies with a fresh or chilled food operation can carry on without it.

The UK's food traditions have long been based on fresh food but economic changes over the last two or three decades have seen the emergence of new family structures and work patterns which have led to the demand for food to be ever more convenient. In many cases still fresh, but more handy.

So let's look a little more closely at MAP's benefits.

**SHELF LIFE EXTENSION:** Depending on the product, the time an item can remain on display in a supermarket or shop can usefully be extended by between 50 and 500 per cent using MAP techniques. This means waste is minimised and ordering and restocking are more flexible.

**MINIMISATION OF WASTE:** If there is a greater chance of a product being sold, as there is with MAP because food can be displayed longer, there is obviously less chance of having to throw it away at the end of its life – which will come no matter how effective MAP has been in prolonging it.

**QUALITY:** There are obvious advantages for both retailer and consumer in having food, which deteriorates at a slower rate as it makes its journey from place of production to the domestic kitchen, fridge or freezer.

**PRESENTATION:** Because MAP products can't merely be wrapped in film – they have to be encased, usually in a tray – retailers have every opportunity to package more attractively. So visual display becomes another key component in MAP's story of effectiveness.

**REDUCING THE NEED FOR ARTIFICIAL PRESERVATIVES:** In a world where we are all intent on becoming 'greener' in our outlook, with a determination to do all we can to protect the environment, there are advantages to getting rid of as many additives as possible. The goal is food, which is NATURALLY fresh and in some cases using MAP means that no artificial preservatives are required at all to achieve a reasonable shelf life.

All these benefits have wide-ranging applications but they are particularly pertinent to those engaged in production of ready meals and cook-chill products. MAP can significantly extend the shelf life of a whole range of such products. Apart from delaying microbial spoilage, the use of a carbon dioxide/nitrogen gas mix (in a 2:1 ratio) has also been found to delay the development of oxidative warmed-over flavour

Cook-chill means food is hygienically prepared, pasteurised and rapidly chilled to between zero and three degrees centigrade. Food is then stored at similar temperatures before being reheated to 70 degrees C for a period prior to consumption.

Under Department of Health guidelines issued in 1989 for cook-chill for the catering industry, the maximum recommended shelf life for products is five days. But this period can be extended if the food is packed under modified atmosphere conditions or cooked under vacuum for the retail market. Tests

have shown that for ready meals and cook chill products with a shelf life of two to five days, modified atmosphere packaging can increase this to between five and 10 days – a hugely worthwhile life extension.

Among ready prepared foods which can benefit are those containing fish, game, meat, pasta, poultry and vegetables as well as casseroles, soups and sauces.

The Advisory Committee for Microbiological Safety of Foods has looked into this whole topic and has concluded that chilled foods with a shelf life shorter than 10 days should, if kept at chilled temperatures, present a minimal risk of the growth of toxin production by clostridium botulinum. The principal method of spoilage of ready meals and other cook-chill products is microbial growth, caused primarily by post cooking contamination, poor temperature control or a combination of the two. Strict control over temperature, handling and hygiene should obviously be maintained throughout so that MAP can play its full part.

If all the guidelines are adhered to ready meal producers, packers and retailers anxious to join the trend towards convenience, both for packing and display, will find rich rewards coming from any venture into MAP. Many have tried and few have failed. Indeed, the majority of the system's devotees find it hard to contemplate what life was like without it.

But before you head off into the brave new world, a final word of advice. Choose a reputable company from which to purchase both equipment and expertise. Look for one with a proven track record in its field and which has a good range of machines from which a choice can be made. Look for one which can also carry out the testing which will be needed on things like the right gas mix. Doing it this way will cut out any risk of failure.

**ENDS**