INNOVATING MEAT PRODUCTS TO MEET CONSUMER WANTS AND NEEDS: KEEPING MEAT ON THE MENU

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Introduction

From the very earliest of times, and certainly well before meat science and technology were defined as disciplines - meat has been adapted for human consumption needs. In fact, by merely coining the term "meat", we are disassociating the basic raw material, from its animal origin –for example, cattle, lambs or pigs - and also distinguishing it from more medical or scientific terms such as "flesh" or "tissue". When we speak of "meat" - we immediately suggest a substance destined for consumption. Over human history, meat has always been adapted to facilitate consumption – with an ever-increasing body of knowledge and practice - building to the point at which we find ourselves today - such that meat science and technology has become a sophisticated discipline. The meat industry is now able to draw on a vast body of knowledge to adapt meat to best suit the needs of today's (and tomorrow's) consumers. However, when we consider current science and technology in the context of contemporary consumer needs, have we really travelled so far, for, whilst the way in which consumer requirements manifest themselves is, self-evidently, constantly evolving, have the core needs of consumers really changed so much over the centuries?

Those in the field of marketing will be familiar with the 4 P's – product, price, promotion and positioning – the elements that marketers believe are core to any marketing strategy. In the world of meat technology, we also have our own version of the 4 P's.

The 4Ps

Basic consumer needs, which, whilst patently manifesting themselves in ever changing ways, do stem back to some fundamentals in the interaction of meat with its consumers.

Palatability

This is an obvious need, but core to what always has and continues to drive consumers to come back to a food product is the critical question - does it taste good? A recent TNS report (TNS, 2005), which investigated home consumption in the UK, revealed that "enjoyment" was the primary driver of food selection in the home – especially for weekend eating. This was backed up in late 2005 by a 2 year study (Foodnavigator.com, 2006), by international ingredients company Tate and Lyle, who in both qualitative and quantitative research in Germany, France and Britain found that 75% of consumers felt that the taste of their choice of food was more important than, or equally important to, it's nutritional merits.

How did ancient man work out that cooking meat made it a whole lot tastier than raw hunks of flesh, and how closely was the discovery of fire and fire-making techniques followed by the idea of cooking meat? Long before Louis Maillard investigated and explained the complex chemical processes that were occurring when meat roasted, people were experimenting with roasting meat - just because it tasted great. It's also no surprise to dedicated carnivores that even in early civilisations meat became the aspirational centrepiece of the lavish meals of the wealthy classes. Homer writes of ancient Greek contemporaries feasting on sheep meat and several Roman authors - such as Petronius - satirised pretentious and upwardly mobile "plebs" for serving meat at every course – a wild extravagance considered to be in poor taste (Grant, 1999). Images of lavish Medieval and Tudor banquets with attendees gorging on meat and tossing the bones to the dogs beneath the tables are also familiar and there is documentary evidence of these menus. (Paston-Williams, year) Meat, therefore, enjoyed for its great flavour and social status, has been with us for centuries and taste continues to be paramount. From these beginnings, much research today in meat science and technology focuses on making meat as delicious as possible to the human palette. We will now move on to our second 'P'.

Portability

So you've nipped out of the cave with a few hunter friends and brought down your sabre tooth tiger or woolly mammoth – now what? You have to get that carcass turned into edible portions pretty pronto – not just before some creature bigger than you decides to feast on your kill – but so that it can be moved and stored in meal friendly portions. This isn't very different from the modern challenges of portioning, packing and transportation for today's sophisticated retail and food service environments.

So you and your hunting party have worked out how to portion and move your felled beast and you have your meat ready for to be prepared for eating. But even with a few friends over – it would be challenging to eat a whole woolly mammoth at once, and who knows when you might have another successful hunting expedition? This brings us to our third 'P'.

Preservation

Being able to preserve meat has always pre-occupied people involved in its handling. In earlier societies where seasonal availability dictated what was available in the daily diet, it was desirable to be able to store meat for later consumption, for example in the long snowy months of northern winters or in the intense summer heats of hot countries. Whilst the understanding of those nutritional requirements that make for a healthy balanced diet is a relatively modern discipline, just through empirical observation many societies have long valued meat for its contribution to growth and strength. It has also been valued for flavour and variety in the largely vegetable and cereal diets of the poorer members of society. Meat has long been required to be moved to where it is needed to be eaten and then stored there without it spoiling to the point at which it is a hazard to health to eat it – or is simply rank and rotten and thus extremely unappetising.

In the home over previous centuries, meat was smoked, dried, iced and pickled to retain its edibility. All these disciplines still find a place in the way in which we handle and present meat for eating today. After the industrialisation of Western society, the urban workforce could no longer live off the land - yet they still needed to be fed and meat was an aspirational part of the diet. Also, the desire for meat to be available under more challenging conditions such as long sea voyages and military campaigns has given us a legacy of meat innovation – from the Mongol horsemen of the 13th century storing and tenderising meat under their saddles – to the methods for the jarring and canning of meat being devised in 1795 by Nicolas Appert (www.answers.com, 2005), out to win Napoleon's 12k franc prize for effective ways to feed French troops with nutritious meat which had not spoiled in transit.

Coming to the present day, the prizes are greater still – with modern consumer markets for meat now worth enormous sums a year –Datamonitor (Datamonitor, 2005a) predict a 2006 market value for meat products at Euro 20.5 billion in Europe alone - delivering the "Meat P's" has become the focus of the vibrant industry in which we work. This brings us to our 4th 'P' of meat technology.

Profitability

In the commercial meat sector, achieving adequate levels of profitability pays wages – so this sector is keen to use the best of contemporary meat technology to improve the potential for profit in modern meat processing. However, consumers are a complex and increasingly individualistic bunch, so choosing those elements of meat technology that have most appeal to consumers is crucial to commercial success. For this, keeping up to date with what is driving consumer needs and behaviour is essential.

The Contemporary Consumer

This section discusses some of the trends which are currently influencing the European markets. Many of these will no doubt have relevance to other developed markets around the world. We will now consider how those basic elements of palatability, portability, preservation and profitability manifest themselves to those in the meat industry today. Palatability leads us to an exploration of contemporary consumer tastes and concerns, and if we extend the definition to include not only the organoleptic properties of meat but also the "intellectual palatability" of concepts in the minds of modern consumers, we can uncover a wealth of significant issues such as farming regimes, animal welfare and ethical production, which are highly relevant to the work of those of us here today. Consumer tastes vary by the cultural and societal context in which a person lives, and despite the effects of globalisation, many consumers still have much-loved dishes and culinary traditions which they hold dear to their hearts – even viewing them as defining elements of their cultural, ethnic or national identity. On high days and holidays, as the saying goes, many will be drawn back to these dishes, but with the busy lifestyles that many consumers in developed countries now lead, food is being eaten in increasing different ways. If meat is to stay on the menu for contemporary consumers, it needs to adapt and present itself as a relevant and desirable constituent of modern diets.

Much consumer research has been conducted to give insight into consumer wants and needs – how they are currently behaving and how this behaviour might evolve. In 2002 in Denmark, the team at the MAPP Centre published a review paper (Brunsø *et al.*, 2002), collating a large body of research into consumers' food choices and perceptions of quality. They constructed a Total Food Quality Model, and within this explored consumer attitudes to beef and pork in several European countries. Their findings demonstrated that quality perception in meat is influenced by both "objective" factors such as muscle conformation, fat distribution and colour and by "subjective" judgements such as the credibility of health statements or claims for superior farming and animal rearing techniques. In fact, their work further showed that the meat industry potentially has even greater hurdles to overcome than in other food sectors. This is because the measures that consumers use to judge a "good" piece of meat – that it will be tasty, tender and succulent – such as a "nice" colour or low levels of fat – are often spurious and actually leave them less likely to choose meat which won't deliver against their expectations. Even marbling, which some consumers felt was a better indication of tenderness, has been proven by tests at the Animal Research Centre, in Nebraska to be a less important indicator than the largely invisible factor of collagen content (Shackleford, 2005). The author has been involved in numerous consumer focus groups discussing purchasing behaviour and meat selection and would consequently agree that we seem to face higher levels of challenge than for other food stuffs.

The underlying messages are encouraging - consumers have strong views on the meat they buy because the area is important to them – meat is seen by those who include it in their daily diet as both a key source of good nutrition and an important focus for a meal occasion – good meat makes or breaks the enjoyment of the meal. The good news continues for those of us with an interest in the beef sector. The 2003 study (Datamonitor, 2005b) by the Food and Brand Lab based at the University of Illinois had American men listing steak as their number one "comfort food" or choice when indulging themselves. Yet, a 1997 consumer audit (Huston, 2005) by the National Cattlemen's Beef Association revealed that 25% of American consumer eating experiences with beef were poor.

For every positive message we have - we always seem to have this potential for consumer backlash and the author's experience of consumer listening groups is that on the whole, customers are very suspicious of those of us providing their meat for them. They have an underlying assumption that the industry is out to trick them, hiding poor quality, fatty and gristly meat under labels that are too large, and obscuring it in brightly coloured opaque trays. So, transparency of packaging – literally and metaphorically - is critical, as is building a reputation through ongoing adherence to high quality standards, which allows consumers to have full confidence in the credence of our quality claims.

Working with a natural raw material is always a challenge, our meat will vary from carcass to carcass to a lesser or greater degree and many researchers are engaged in the study of those factors, which ones trigger variation and what can be done to ameliorate those effects – from breeding, to feeding and slaughtering techniques. In the past we have also turned to processing methods to help us even out variability and achieve consistency – yet this route is also increasingly being challenged by contemporary consumer attitudes.

Food, being an important part of everyday life, is sensitive to the so-called mega-trends in society. In particular, 3 major well documented trends seem to be re-occurring in research into consumers' food choices in both Europe and the USA - convenience, health and wellbeing and indulgence or personal satisfaction – all of which are now manifesting themselves into the way in which people select and purchase foods. As a consequence, the meat products we offer for retail and food service sale need to demonstrate, through their composition, design and marketing positioning that these trends have been fully understood and addressed. In addition, it is becoming increasingly evident from research into consumer attitudes and actual behaviour that consumers are becoming progressively more polymathic in their psychological interaction with food. No longer can we safely just group consumers into broad generic behavioural groups based on social class, economic circumstances, educational status or postcode and assume that this will be as relevant for their choice of foods as it is for their taste in books or selection of shampoo. Within each contemporary consumer can exist an intricate set of interrelated, sometimes contradictory and ever-evolving mental filters that build to a complex individual psychographic profile. Each individual's experiences and how they recall and interpret this to build aspirations and perceived needs, will lead to lifestyle choices and behavioural patterns and their relationship to meat products will be no less influenced by these complex and converging trends.

Convenience is becoming an over-worked term, but at its core is a desire by consumers to seek out products which effectively and efficiently allow them to juggle the multiple tasks that they have to accomplish in the day, and to fulfil their desire to increase the time they have for the priorities in their lives – be that quality free, leisure and family time. Unless we in the meat supply chain cater to consumers' desire to eat meat in more convenient formats then our part in the meal selection will diminish in both relevance and volume. Convenience can be delivered in a variety of ways – prior preparation of meat items removes the need for consumers to have an in-depth knowledge of meat cuts – both reflecting and acknowledging the skills gap that exists in the general public. Meat that is partly or fully prepared and ready to pop in the oven in its tray even removes the need for the consumer to handle meat – a task that many find distasteful and off-putting.

In western societies we are now increasing eating in less formal situations. The trend towards informal and fragmented eating is well documented. We are experiencing the demise of formal "mealtimes", and the rise of phenomena such as S.A.D. – "Stuck At Desk" eating – nick-named "Al desko" eating, along with the trend towards eating more frequent smaller quantities of foods, eating whilst on the move – so called "Dash Board Dining" – a term for in-car eating. People are also more likely to skip meals altogether these days – maybe topping up on energy boosting snacks as they get hunger pangs later in the day. For example, a survey (Datamonitor, 2005c) commissioned by Smoothie King in 2004 in the USA found that lunch is skipped by 58% of US consumers in favour of on-the-go alternatives. Of those who do take lunch 82% regularly spend 30 mins or less and 43% as little as 15 mins on their lunch slot. All across Europe and the USA the average length of journey to work is rising, eroding free time at either end of the day. These busy consumers now want convenient food at their finger tips. At a recent focus group of working mothers that the author attended, 7 out of 10 stated that at 3pm they had no idea what they would be serving their families for the evening meal. They now "repertoire shop" - that is they load their shopping trolleys with a selection of items that they know the family will eat – and then mix and match these ad hoc as they pull a meal together in the home. Younger consumers and those older "empty nesters" with no responsibilities for feeding a host of "chicks" can afford to be and are even less planned, relying upon their fridges, freezers (where most have selected fresh meat and frozen it themselves) along with takeaway menus and local restaurants to keep them fed and watered.

So the industry has to rise to the challenge. The erosion of formal "at the table" and "meat and two veg" eating occasions could equate to the erosion of our own market for meat. From a home-cooked meal in which meat may be 50% or more of the meal's weight, its more convenient alternative - say a pizza or a pasta ready meal - may have less than 10% meat. It all has potential to diminish our "share of stomach" and our sales volumes unless we can make our meat products highly relevant to the consumer's new eating patterns.

Both product formats and their presentations have to accommodate this new consumer behaviour. Beyond the meat itself, the packaging solutions must meet the needs of a widening number of eating venues and situations – on the move (on the tube, in the car, at your desk), easy open (for an increasingly economically active grey market), non-spilling/ re-sealable, ovenable/ microwavable and even self-heating. Of course the industry hasn't stood still. When it comes to the portioning of meat – we've sliced it, diced it, wafer-thinned it, reformed it into burger patties and made bite-sized snacks. We have extended its shelf life through preservatives, anti-oxidants and modified atmosphere packs. We have further prepared it in oven-ready portions, we have cooked it and made it ready to microwave in minutes. Yet, you only have to cross-reference a market, such as the dairy sector, to see the accelerating trend to make food able to be consumed away from the traditional " table at home", solving the practical difficulties of mess and sticky hands and the social inhibitions of wafting smells etc.

A critical determinant in many peoples' choices of food is now also the contribution that food can make to their overall wellbeing. Whilst the number of people actually following a prescriptive weight-loss diet is falling - a Healthfocus International Survey in 2005 (Datamonitor, 2005b) found that only 8% of American consumers fell into this group - the number of those actively seeking out foods and drinks to "ensure good future health" has risen above 30%. Similarly, with 75% of US shoppers seeking to "eat light" rather than diet and over 50% of UK consumers feeling they follow a well-balanced diet, meat - as an acknowledged nutrient-rich food - has to find its successful role in this trend. On the plus side for those in the sector, meat is not grouped with the type of sugary, highly processed foods that the European Commission Green Paper (European Commission, 2005) on "promoting healthy diets", which was published in late 2005, dismissed as "energy-dense and micronutrient-poor". Most consumers do believe meat can be part of an inherently healthy diet.

Yet we have challenges here too. Where previously the natural variability of meat has been evened out through the addition of chemicals – through the use of brines, tumbles and injections – this is now increasingly coming into conflict with the desire for natural unadulterated foods. Our challenge will be to ensure the consistent eating quality of meat in an environment that is demanding reduced or even completely additive-free products. Maintaining taste and preservation without salt or at significantly reduced salt levels has been a hand's on pre-occupation of the author's team of Meat Technologists along with many others in the industry over the past 18 months. Salt's link with raised blood pressure and the life-threatening diseases attributed to hypertension, continues to be very much at the forefront of government and media attention and therefore salt reduction remains on all our agendas. Studies, such as those by Dr Thun and colleagues (Chao *et al.* 2005) at the American Cancer Society, into the increased incidence of colon cancer in people eating high levels of red meat may inhibit consumers from including red meat in their diets, yet this may be countered by the growing trend of "less of the best". This is the tendency – especially noted in older consumers – to meet their "self-indulgence" needs by still treating themselves to what they crave – just in smaller quantities. So the demand for high quality and premium positioned meat products – targeted at the "a little of the best" consumer may prove a profitable sector for us to explore – as long as we can deliver viable product concepts with claims that the consumers find to be credible.

May we even go further and add "positive" nutrition to our meat – either via pre- or post-slaughter methods, boosting its health credentials through the addition of desirable nutraceuticals? The Dawn Group is supporting a Masters Degree project investigating the consumer acceptance of this topic during 2006. The modern consumer is looking for even more. In meeting their needs for a convenient product, a healthy product or an indulgent product we have succeeded in raising their expectations; now delivering one of these attributes in isolation is likely to be no longer enough. Whilst we in the meat industry have worked hard to rise to the "mega-trend" challenges, it seems we must now go further still. Building on the Danish "Food Related Lifestyles" work by the MAPP Centre, Teagasc (Teagasc, 2003) undertook further research in 2003 in the UK and Ireland and has attempted to define some new demographic groups with specific attitudinal and behavioural characteristics in relation to food. This research has substantiated the interaction and overlap between these key trends. As consumers experience expands, this drives higher expectations of us as food manufacturers and food industry experts to deliver the ultimate combination of attributes. Further consumer studies such as the 2005 Mintel reports on "Eating and Work" (Mintel, 2005a) and "Cooked and Delicatessen Meats" (Mintel, 2005b) highlight the need for new meat products that span more than one mega-trend. For a product to succeed, it must " convey a bundle of intrinsic and extrinsic attributes that better meet the rational and emotional needs of the different consumer groups within the overall shopping base" (Mintel, 2005b). Attitudinal research from several Datamonitor reports (Datamonitor 2005b,d, 2004) supports this further, challenging us to resolve the dilemma that consumers believe the most tasty food will be likely to be the most unhealthy and that healthy foods will be lacking in taste (Datamonitor, 2005b).

Conclusions

The challenge for the meat industry is to create meat products that taste fantastic, deliver sound health and nutritional benefits, and are presented in a format deemed convenient in a wide selection of eating occasions. Our brands must only make those claims that consumers find credible, engaging and relevant to their lives today. Our reputations must go before us, building trust and securing consumer confidence. So, it may all be a long way from that original Woolly Mammoth - but with the skill, expertise and enthusiasm we have within the industry, we will be more than capable of rising to the challenge of keeping meat securely on the menu in the years ahead.

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