

# The Challenges Facing Savory Flavor Formulation

Flavorists face rising food prices, legislation and competition as the demand for savory flavors explodes

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Savory flavorings is a growth market that is predicted to increase significantly over the next five years in line with the rapid growth of the consumption of meat products. The Food and Agriculture Organization (FAO) reported that global consumption of meat is estimated to grow from 250 million tonnes per annum to 300 million tonnes by 2020, and to more than 450 million tonnes by 2050.<sup>1,2</sup> The graph in F-1 shows that most of this growth is in developing countries, with meat consumption in developed countries leveling off. The supply of ingredients to support this market will grow in tandem with meat consumption and will have a major impact on savory flavors.

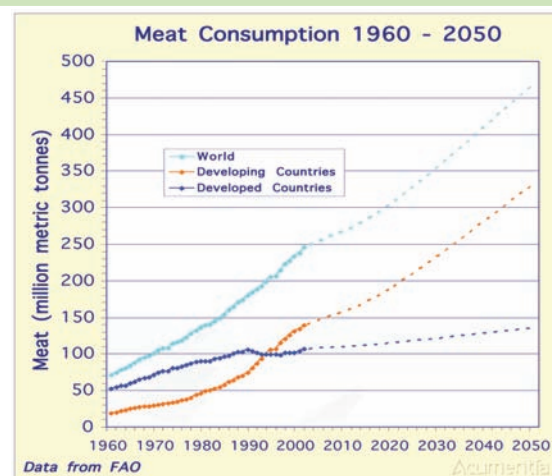
## Training Savory Flavorists

The training of a savory flavorist takes many years and is never truly complete. To be successful the flavorist must rely on experience, judgment, flair and intuition, plus an extra spark of creativity. Few training courses are available that provide some of the basic training elements such as process reaction flavors, top note blending and applications.

A completely new course—Creating Savory Flavors—launched this year in the United Kingdom will address this gap and span savory flavors from the chemistry and technology through formulation to application, covering all the essential ingredients used on the way. The course will give flavorists a chance to step outside their normal daily activities and really focus on the components and construction of a savory flavor. They will have the opportunity to go back to basics to examine the interaction between the components and study synergies and clashes, understand how a flavor functions in the final food product and trace that performance back to the individual components within the formula. An essential element to this course is a session on creativity. There is much talk about the creativity required to become a successful flavorist, and techniques are offered that the flavorists can take back to their companies and enhance their development programs with a fresh impetus. For more information on the Verner Wheelock training course, visit [vwa.co.uk](http://vwa.co.uk).

Meat consumption 1960–2050

F-1



A second factor that will influence the supply of savory flavors is the soaring price of food products. The efficient use of meat will drive the market towards ingredients that can extend its application and make better use of off-cuts and parts of the animal that are currently out of vogue.

A third area of increasing importance is the growth of aquaculture and the farming of fish. This technology is going through a revolutionary phase with annual growth at 6%; in 2006 over one-third of all fish consumed, representing around 46 million tonnes, was farmed. More species, both fresh and salt water, are being successfully added to the portfolio of farmed fish. The FAO sees this as crucial in the fight against hunger and estimates that production from sustainable fish farming will need to double by 2030 to keep pace with a growing world population.<sup>3</sup> By comparison, around 90 million tonnes of caught fish is consumed globally and this has been stable since 1980 and, due to pressure on marine ecosystems and the over-fishing of many species, this is predicted to remain at this level for the foreseeable future. By 2030 the combination of meat and fish consumption will grow to around 500 million tonnes per annum.

## The Growing Demand for Savory Flavorings

The rapid growth in the consumption of meat in developing countries, especially China where pork and chicken

are in great demand, will positively affect savory flavorings and seasonings. Many of the world's flavor houses are building manufacturing capability at both ends of this great continent, in Singapore and Shanghai, to supply this market.

The Indian sub-continent is another important developing region experiencing colossal economic growth. India now has a new middle class of around 350 million people who work long hours and at the end of the day are looking for convenience foods. The “modern trade” as they call it, e.g., supermarkets, are establishing themselves in India but at the moment only around 2% of food is supplied through these outlets; this is predicted to grow to 50% within 10 years. In addition, the relatively smaller countries in Southeast Asia offer significant growth markets for savory flavorings.

The challenges facing the supply and formulation of savory food ingredients to these regions is immense and will place great demands on the creativity and skills of flavorists in the flavors and seasonings industries worldwide. Flavorists will have to understand and respond to the regional variations in taste and develop products that meet market needs. To achieve this, the ingredients in greatest demand will be process reaction flavors, natural extracts, yeast extracts, hydrolyzed vegetable proteins, top note flavorings, enzyme digests, fermented products and spice/herb extracts and oleoresins.

### **Rising Food Prices**

The sustainability of the global food supply and the food security of millions of people are under threat as the demand for food products exceeds supply. The rising costs of food and food ingredients are putting food manufacturing margins under pressure and excessive value engineering could end up damaging products and brands. This is a major challenge confronting flavorists whose role is to provide taste and character within new and tighter cost constraints. The demand for natural flavorings will be balanced against the high cost of these ingredients compared to more cost-effective savory ingredients, such as nature identical top notes and process reaction flavors. The technologies and food additives exist to help manufacturers produce quality products at a lower price.

The pressure will be on these manufacturers to reformulate existing products or develop new products with a lower cost base and possibly to compromise their natural claims.

### **Natural Savory Flavorings**

In the developed West the desire for clean label products will continue and the demand for natural flavorings will increase, especially as retail groups spread globally. However, confronted with an increasing demand for waste reduction, improved carbon footprint and rising prices, food manufacturers and retailers will be faced with a requirement to reduce losses in the food chain and improve the shelf life and stability of consumer products.

This may herald a return to cheaper food additives and preservatives for certain brands, particularly those that can claim a natural status. The formulation of natural savory flavorings is a real challenge to flavorists, especially in Europe where process flavorings, for example, can't be called natural and new legislation will exclude the term *nature identical*. Interestingly, while the new European legislation works to get rid of the term *nature identical*, the nomenclature has recently been incorporated into new legislation in Australasia and South America.

Enzyme technology is being increasingly used to produce natural ingredients that can be flavors in their own right or raw materials for further use in process flavors or blending into compound flavorings. The growing sophistication of enzyme systems is providing new opportunities for creating natural flavors and this is where unique ingredients are also of great benefit. These may be local foods and ingredients that will add a regional influence to flavorings, making it difficult for competitors to copy. Additionally, this is one way that smaller flavor companies can protect their local markets against the power of the big global players.

### Matching Savory Flavors

The savory flavor market is highly competitive with the large global giants dominating and the smaller regional companies competing within their territories. The matching of flavors is now very much standard practice in the flavor industry and is leading to the erosion of flavor margins and profitability. Even small flavor companies have the ability to match flavors using technology such as mass spectrometry. To protect against matching, complex flavors such as process flavors are being increasingly used to safeguard formulations. It is very difficult to copy a process flavor because the raw materials employed have largely been used up and the analytical profile is very complex, containing hundreds of compounds formed in the reaction. Top note flavors can be incorporated into process flavors, protecting their identity and making them difficult to detect by analysis against the multitude of other compounds present. The flavorist's job then is not merely to achieve the flavor target and meet the customer's requirements; it is also about protecting the identity of the formulation by making it difficult to copy.

### Legislation

Flavorists have no choice but to work within the legislative framework of their target markets. Therefore, it is imperative that they are fully informed and have a working understanding of the limitations that such legislation imposes upon their work. In the United States, process flavors are regulated through a Code of Practice developed by the International Organization of the Flavor Industry (IOFI) and are considered as Generally Recognized As Safe (GRAS). The manufacturers comply with the IOFI Code of Practice, which provides detailed advice on the ingredients, processing conditions and labeling of process flavors. Under these guidelines, process flavors are either natural or artificial, depending on whether

natural materials or artificial raw materials are used in their manufacture.

In Europe the situation is very different and process flavors can't be natural. They are defined in a special category as simply "process flavorings" and the definition requires that they are manufactured using a source of amino nitrogen and a reducing sugar. New regulations expected to come into force by 2012 will change the situation and "thermal process flavorings," as they will then be called, will be either derived from food and/or "source material other than food." If they contain any of the latter, they will have to be approved and this will most likely involve toxicological studies on animals and hence be very costly. The same conditions will also apply to new legislation concerning precursor flavors and the definition of food is therefore key to determining which ingredients will be classified as "source materials other than food" and it is not yet clear which ingredients will fall into this category.

Consequently, in advance of the new regulations, manufacturers of process flavorings are converting them to flavoring preparations, which by definition are natural. This will necessitate that natural materials are used in their manufacture and that the flavor is produced using a traditional food process such as cooking, roasting, grilling, baking or frying. There is also a very curious new definition of the conditions required to produce thermal process flavorings that could be interpreted to mean that they can't be manufactured below 125°C. Clearly, the proposed new legislation has not been thought through and this represents a real challenge facing the creativity and ingenuity of flavor chemists and flavorists in Europe and those supplying products into Europe.

One of the few other places in the world where process flavorings are regulated is in the Mercosur countries of South America: Argentina, Brazil, Paraguay and Uruguay, which enacted laws in December 2006. Their definition of process flavors is an amalgam of the European legislation and the IOFI Code of Practice and they can be either natural or synthetic depending on the raw materials used. The legislation being applied here takes the best from both worlds and is far in advance of the impending new European legislation.

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