

# **FOOD FLAVOURINGS**

**Edited by P. R. Ashurst**

**Blackie**

# **Food Flavourings**

Edited by

**P.R. ASHURST**

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Hereford

**Blackie**

Glasgow and London

Published in the USA by

**avi**, an imprint of

Van Nostrand Reinhold

New York

Blackie and Son Ltd  
Bishopbriggs, Glasgow G64 2NZ  
and  
7 Leicester Place, London WC2H 7BP

Published in the USA by  
AVI, an imprint of  
Van Nostrand Reinhold  
115 Fifth Avenue  
New York, New York 10003

Distributed in Canada by  
Nelson Canada  
120 Birchmount Road  
Scarborough, Ontario M1K 5G4, Canada  
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

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First published 1991

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**British Library Cataloguing in Publication Data**

Food flavourings.  
1. Food. Flavourings  
I. Ashurst, P.R.  
641.338

ISBN 0-216-92918-0

**Library of Congress Cataloging-in-Publication Data**

Food flavourings / (edited by) P.R. Ashurst,  
p. cm.

Includes bibliographical references.

ISBN 0-442-30281-9

1. Flavoring essences. I. Ashurst, P.R.  
TP450.F66 1990  
664'.5—dc20

89-29401  
CIP

## **Food Flavourings**

## Preface

The flavour industry has become a vital element in the growth and success of food and beverage industries worldwide. The development of many new products is now directly related to the use of the appropriate flavouring which, among other benefits, has allowed the use of many novel raw materials. The phenomenal growth of specialised consumer products offering special tastes, nutritional benefits or 'convenience' almost always directly involves the use of a bespoke flavouring.

With recent growth in worldwide concern for environmental issues has come a corresponding concern for the use of 'natural' ingredients in foods. The flavour industry has been closely involved, by offering many of its products as natural alternatives, although the vexed issue of what 'natural' means has promoted discussion and debate in many quarters. The European Flavouring Directive has attempted to incorporate a definition. This is discussed further in chapter 1.

The work of the flavourist remains akin to that of the perfumer, despite inroads made by sophisticated analytical technology. For example, use of linked gas chromatography-mass spectrometry (GC-MS) instrumentation enables the skilled analyst to identify most components of a competitor's flavouring or the minor ingredients of a natural extract. Despite this, the industry remains a unique blend of art, science and technology in which the experience and knowledge of the flavourist is vital.

There are relatively few books about flavourings or the flavour industry, although many of the individual substances used are well documented. The industry remains highly secretive although mergers, technology and legislation have eroded many of the traditional secrets.

This book is intended to be a practical companion to the flavourist, the applications technologist and the technical sales person, and it will make a worthwhile contribution to the laboratories and libraries of all who are concerned with the manufacture or use of flavourings. It is intended as a source of basic information in a readable form, although it is not intended to provide formulation data. Individual formulations remain the lifeblood of the industry.

The book is in three main sections. The first section, chapter 1, is introductory and is concerned with the marketing of flavourings and legislative controls.

The second section, chapters 2-5, covers the main groupings of the raw

materials of the industry. These are essential oils, natural extracts, fruit juices and perhaps most important of all, synthetic ingredients. The first three chapters of this section cover natural ingredients whilst the last covers both nature-identical and artificial components.

The third section, chapters 6–10, covers some of the main user industries, although the final chapter could in many respects stand alone. Chapters covering the user industries—beverages, confectionery, baking and the dairy industry—provide an outline of the technologies involved, where they are essential to an understanding of interaction with flavourings and their use. In some cases they cover the development of natural flavours within the products themselves.

The final chapter deals with process flavourings, which are playing an increasing role, and especially savoury flavourings. The chapter deals with their history, ingredients, methods of manufacture and application.

It is acknowledged from the outset that the book will have its shortcomings, if for no other reason than the sheer impossibility of covering all the aspects of a subject of this magnitude in one volume. Although I accept full responsibility for its faults, the book is the creation of its authors, all of whom are acknowledged experts in the practical application of their subject. I am indebted to them for their contributions and tolerance.

P.R.A.

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# 1 Introduction

E. COWLEY and J. KNIGHTS

## 1.1 General Introduction

In broad historical and traditional terms, the Flavour Industry has consisted of the blending houses who have created, manufactured and sold flavourings to the final user in end-products. In the context of the major forces shaping the present and the future of the industry, consideration must be given to:

- (a) industry competition
- (b) new entrants
- (c) substitute products
- (d) bargaining power of suppliers
- (e) bargaining power of purchasers

Such a strategic analysis should identify the position of the industry within society and, in turn, the position of a company within the industry. This should reveal advantages and disadvantages for the business in respect of competition, no matter from which direction it will appear.

### 1.1.1 *The U.S. Flavour Industry*

Dorland and Rogers in their book *The Fragrance and Flavour Industry* [1] stated: 'Fifty years ago the essential oil and aromatic chemical industry of the United States consisted of about seventy firms, three quarters of which are no longer in existence. Over fifty of these companies were located in New York City, most of them in a small area of two or three blocks on the east side of Lower Manhattan, close to the docks.'

Of the seventy suppliers of essential oils and aroma chemicals listed in 1927, only the following were quoted as still doing business under the same name in 1978, and most can identify further changes in the decade 1978-1988.

Felton International Inc.  
Florasynth Inc.  
Fritzsche, Dodge & Olcott Inc.  
Givandan Corporation

Compagnie Parento Inc.  
Polak's Frutak Work Inc.  
Rhodia Inc.  
Roure, Bertrand Duport Inc.

D.W. Hutchinson & Co	Synfleur Scientific Laboratories
Hymer Aromatic & Import	A.M. Todd Company
J. Manheimer Inc.	Ungerer & Company
Neumann-Buslee & Wolfe Inc.	Van Dyk & Company Inc.
Norda Inc.	Albert Verley & Company

Other firms had undergone mergers or name changes, e.g. IFF, Lueders, Gentry; others have disappeared.

On the other hand, there was the appearance on the American scene of major companies such as Dragoco Inc, Firmenich Inc, Haarman & Reimer Corp. and others, none of which were apparent in 1927. Some very interesting individual company histories are reported by Dorland and Rogers [1] together with some potted biographies of the industry characters of the period.

### 1.1.2 *The U.K. Flavour Industry*

A similar picture is drawn in the United Kingdom and it is illustrated by comparing the members constituting the British Essence Manufacturers Association (BEMA) in the years 1917 and 1988.

#### *Members in 1917*

Clayton & Jowett Ltd	A. Boake-Roberts Ltd
W. Meadowcroft & Son Ltd	Stephenson & Howell Ltd
Duckworth & Co Ltd	John Stow
Burgoyne, Burbridges & Co Ltd	The Confectioners, Veg Colour &
W.J. Bush & Co Ltd	Fruit Essence Co
Manchester Chemical Co Ltd	C.W. Field Ltd
Barnett & Foster	John Cummins
	Bratley & Hinchcliffe

#### *Members in 1988*

Duckworth & Co Ltd	I.F.F.
Bush-Boake-Allen Ltd	Lucas Ingredients
Barnett & Foster Ltd	Fries & Fries
H.E. Daniel	Givandan
Dragoco Ltd	E.F. Langdale
Edlong & Co	Felton
Firmenich	P.P.F.
Cooke, Tweedale & Lindsay	P.F.W.
Dubois & Rowsell	Tate & Lyle
Eglington Yates & Co Ltd	Schweppes.
Florasynth	Pointings
F.D.O.	Zimmerman-Hobbs
Grindsted Products Ltd	

Even during the period of 12 months 1988/1989 there have been significant changes in the membership of BEMA due to acquisitions, mergers and new entrants. Others have left the arena. The evolving story is similar to that occurring in the U.S. flavour industry.

What is not evident from the above is the rationalisation of products, product lines, customers and suppliers over the past 20 years. For example in the 1960s at least ten of the flavour companies had major product lines in compounded citrus juices with flavours and emulsions, but possibly only two have these products today. Self-sufficiency in raw materials has been rationalised for economic reasons but there are present day signs of a revival.

### 1.1.3 *The European Flavour Industry*

Development in the major continental Western European Countries parallels experience observed in the United States and the United Kingdom, i.e. the growth of the national industry, rationalisation, mergers and the invasion of the multi-nationals.

The membership list of SNIAA (Syndicat National des Industries Aromatiques Alimentaires) of France published in 1987 demonstrates some of the trends in the industry in that country.

#### *Members in 1987*

Aralco	Isnard
Aromex	Jaeger
Baube	Laurent
D. Blayn & Cie	Lautier Aromatiques
Camilli Albert & Lalque	Mane Fils
Colodor	Mero Rousselots
Daul	Metayer Aromatiques
Durban	Noirot
F.D.O.	P.C.A.S.
Felton World-Wide Fr	Quest International
Firmenich	Reynaud & Fils
Fontarome	Rhone-Poulenc C.H.
Gaget	Robertet S.A.
Gazan	Sevarome
Givandan France	Sima France
Granger Bouguet P.	Soco Fruits
Guedant	Vernier
Haarman & Reimer	

The presence of multi-nationals in the French market is significant, as some of these are not members of SNIAA. There are also good examples of traditional



raw material suppliers searching for the higher added value of compounded products.

Moving to Eastern Europe, the growth of the national industry has not kept up with the pace observed in the West but the nuclei are in place for rapid growth once the demand is stimulated by the needs of the end-user industry for more volume of flavouring and greater variety of technological need. There is little doubt that once the problem of 'profit convertibility' is solved joint ventures in the East will be looked upon as a more desirable target by the international companies.

#### 1.1.4 *The Far East Flavour Industry*

The most significant recent growth has been in the Japanese flavour industry and their expansion into the international markets as global players. However, parallel to this has been the intensification of effort of the multi-nationals into this area of high growth and comparative affluence linked to convertible currencies.

One of the challenges for the future of the flavour industry must be the Chinese market but selecting the right time frame to gain competitive advantage whilst not falling foul of restrictions is all important. Local production in this geographical area is evident and the emergence of new players in the overall flavour industry is also visible. This in some countries manifests itself through divisions of large industrial users.

#### 1.1.5 *Classification of Flavour Companies*

From this brief survey we can see that the flavour industry (i.e. the industry composed of those companies which create, blend and sell flavourings) consists of members whose roots are varied and can be categorised as follows:

- (a) Original flavour manufacturers with facilities for chemical synthesis, distillation/extraction and compounding. In some instances these companies have moved towards supply of general food additives as part of a horizontal integration rather than restricting themselves to flavourings alone.
- (b) Original speciality chemical manufacturers who are moving closer to producing finished flavourings.
- (c) Original end-users of flavourings who detected a 'business inside the business' who now manufacture, use and sell compounded flavourings.
- (d) Original processors/importers of raw materials who have moved to blended products in search of higher added value.
- (e) Original flavour manufacturers who have been acquired by larger industrial groups, e.g. chemical manufacturers. Presumably, such companies perceived advantages in the amalgamated businesses.