



Wiley Trading Advantage

A close-up, artistic photograph of several white sugar cubes. The cubes are arranged in a way that creates a sense of depth and texture. The lighting is soft, highlighting the facets of the sugar. The background is a blurred, light blue-grey color.

# THE INTERNATIONAL ♦ SUGAR TRADE ♦

A. C. HANNAH & DONALD SPENCE ♦

Published in association with the International Sugar Organization

# ***The international sugar trade***



A C HANNAH  
DONALD SPENCE

Published in association with the  
INTERNATIONAL SUGAR ORGANIZATION



**John Wiley & Sons, Inc.**

New York • Chichester • Weinheim • Brisbane • Singapore • Toronto

This text is printed on acid-free paper.

Copyright © 1996 by Woodhead Publishing Ltd.  
Published 1997 by John Wiley & Sons, Inc., by agreement  
with Woodhead Publishing Ltd.

All rights reserved. Published simultaneously in Canada.

Reproduction or translation of any part of this work beyond  
that permitted by Section 107 or 108 of the 1976 United  
States Copyright Act without the permission of the copyright  
owner is unlawful. Requests for permission or further  
information should be addressed to the Permissions Department,  
John Wiley & Sons, Inc., 605 Third Avenue, New York, NY  
10158-0012.

This publication is designed to provide accurate and  
authoritative information in regard to the subject  
matter covered. It is sold with the understanding that  
the publisher is not engaged in rendering legal, accounting,  
or other professional services. If legal advice or other  
expert assistance is required, the services of a competent  
professional person should be sought.

*Library of Congress Cataloging in Publication Data:*

ISBN 0-471-19054-3

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

# *Foreword*



**W**hen Woodhead Publishing invited the International Sugar Organization (ISO) to act as a co-publisher for a book on the international sugar trade, there was not the slightest hesitation to accept. To the contrary, for the ISO as the unique governmental body dedicated to improving conditions on the world sugar market through debate, analysis, special studies and transparent statistics the proposal was very much welcomed because it fitted extremely well into our general philosophy to contribute to better market transparency and to offer more and better services, primarily to our member countries, but also to all other parties involved in sugar matters, such as growers, millers, refiners, traders, consumers and the media.

Since the late 1940s the ISO has been at the forefront of sugar statistics and analysis. In particular *The World Sugar Economy – Structure and Policies* (1963) remains a standard work today, much consulted by researchers and analysts. It was therefore particularly appropriate that the ISO should be associated with this book, which perfectly fits the current philosophy of the Organization.

The book in hand fills a gap because it deals in a condensed and comprehensive way with the challenges and key features of the world sugar economy. This book on the international sugar trade together with the annual ISO Sugar Year Book, the newly published book on ISO World Sugar Statistics 1955–94, our regular publications and

FOREWORD

studies and our international workshops, seminars and forums, hopefully help to explain the complexity of the world sugar situation and contribute to a better understanding.

*Dr Peter Baron  
Executive Director  
International Sugar Organization*

# Preface



**S**ugar is unique. We hope that anyone reading this book will be convinced of this before reaching the end. In its historical, political, sociological, economic and geographical aspects sugar has built up a track record of associations which mark it out as different from other soft commodities.

Although the title of this book is *The International Sugar Trade*, it is impossible to describe and analyse sugar trade without first discussing sugar's history, its production processes and consumption patterns – trade is the residual. The book is therefore designed to be a comprehensive account of sugar, the commodity. As such it fills a gap, not only in the publisher's series, but also for a detailed book covering all aspects of the world sugar industry. Remarkably, for such a fascinating subject, the last comparable book was Timoshenko and Swerling *The World's Sugar – Progress and Policy* published back in 1957 (and still, surprisingly, in print). We have therefore tried, where possible, to carry the main body of the analysis and statistics back to the early 1950s to provide some continuity with Timoshenko and Swerling. A secondary, but important objective was to provide, where possible, long series which fellow analysts might find useful in their work.

While trying to avoid overlapping, each chapter is constructed to be a self-contained essay on the subject matter, so the book can serve equally as a reference on specific topics as well as an overview of the

world sugar economy. The book is thus aimed at a wide audience, from specialists looking for more background, to traders coming to sugar for the first time, and finally students, non-specialists and laymen in search of an introduction to the fascinating world of sugar. It covers the diversity of production and consumption, the properties and popularity of sugar and also refers to the health issues and alternative sweeteners. The book is co-published with the International Sugar Organization, whose statistics are used, with few exceptions, throughout.

Part I covers the origin, background and production of sugar, and places sugar in its political and sociological context. Part II starts with a review of sugar policies – sugar is the type of commodity around which complex production policies have grown – and goes on to deal with major producers and consumers and substitute products. Part III focuses on the trade itself, including a structural analysis of the world sugar trade, trends in prices and trading techniques. Part IV deals with future trends, and the appendices cover important issues such as sugar and health, sugar and the environment, the Brazilian fuel alcohol programme and international sugar agreements.

The authors would like to acknowledge with gratitude the contribution of Mireille Neri, of the ISO Secretariat, who prepared the charts and the larger tables, and Victoria Greatorex, also of the ISO Secretariat, who prepared the manuscript.

*A C Hannah  
Donald Spence*

# Contents



*Foreword by Dr Peter Baron* . . . . . *vii*

*Preface* . . . . . *ix*

## **PART I Origins, background and production**

**1** A brief history . . . . . 3  
Production 3 Consumption 10 Trade 11

**2** Cultivation . . . . . 15  
Cane 15 Beet 16 Processing 17 Refining 18

**3** Sugar in its political and sociological context . . . . . 20  
More than just a sweetener 20 Sugar and  
international politics 22

## **PART II: The world sugar economy today**

**4** National policies . . . . . 27  
Why national policies have evolved 27 National  
policies in some important countries 31 Sugar  
and the Uruguay Round agreement on agriculture 44



<b>5</b>	Supply . . . . .	46
	World production 46 Developments in world production: global production trends 48 Production trends by country 53	
<b>6</b>	Demand . . . . .	68
	An important source of energy 68 Current consumption patterns 68 Per capita consumption patterns 70 Global consumption trends 73 Consumption trends by country 75	
<b>7</b>	Exporters and importers . . . . .	85
	Exports 85 Imports 89 Developments in the trade since 1955 92 Conclusions 108	
<b>8</b>	Substitute products . . . . .	110
	Alternative sweeteners 110 Consumption trends 115 Sugar and health 116	
<b>PART III: The trade</b>		
<b>9</b>	Trends in the world trade . . . . .	123
	Factors contributing to volatility 123 The structure of the world market - evolution 128 Conclusion 138	
<b>10</b>	Trends in world prices . . . . .	140
	Price volatility characteristics 140 Deflated prices 145 Prices and stocks 147	
<b>11</b>	Futures markets . . . . .	152
	History 152 Current contracts 154 The New York market 156 Other markets 159 Options 160 Uses of the futures markets 161 Speculation 163 Forecasting techniques 165 Regulation 166	
<b>PART IV: The future</b>		
<b>12</b>	Key issues for the future . . . . .	171
	Structural change 171 The break-up of the USSR 175 Enlargement of the EU 177 Other key players 177 White versus raw sugar 178 Alternative sweeteners 178 Vertical diversification 179 Diversified end-uses 180	

## CONTENTS

<i>Appendix I</i>	Sugar and the environment. . . . .	181
<i>Appendix II</i>	Sugar and health . . . . .	191
<i>Appendix III</i>	The Brazilian alcohol programme. . . . .	200
<i>Appendix IV</i>	International sugar agreements . . . . .	220
<i>Appendix V</i>	World sugar situation 1955-94 . . . . .	238
<i>References</i>	. . . . .	241
<i>Index</i>	. . . . .	244

PART

---

# ***I***



## ***Origins, background and production***



# 1

## *A brief history*

### Production

**T**he evolution of sugar into the nutritious and plentiful plant of today took a long time. It is now widely assumed that the natural home of sugar cane is the Polynesian islands of the South Pacific where it is believed to have existed as long ago as 2000 BC. It was well known in India a thousand years later and in Persia around 500 BC. One of Alexander the Great's generals came across it in Persia and called it 'the reed which makes honey without bees'. From around 100 BC it was introduced into China and other Far Eastern countries and by AD 100 the art of sugar making was well advanced throughout those areas.

Hitherto, the only source of sweetness was from honey; bees are often found amongst the hieroglyphics that surround Egyptian tombs, signifying that the person, when alive, kept them.

Later, the armies of the prophet Mohammed also found sugar in Persia whilst waging a holy war designed to convert the whole world to Islam in about AD 630. It was quickly introduced to all the surrounding countries within the prophet's sphere of influence and spread to the north coast of Africa, eventually reaching the western end of the Mediterranean.

At this time it was known as the Persian reed and the production of sugar from it was very primitive. It involved a blindfold and tethered mule or ox walking in a circle, driving a vertical grinding mill to crush the cane. The juice was then evaporated, by boiling, to leave a mixture of crystals and syrup. It did not keep very long and could not be stored. This method is still used in parts of India and elsewhere.

Almost five hundred years later, in 1100, the first samples of the Persian reed reached Britain, brought back by the returning Crusaders. However, it was not until the early fourteenth century that it started arriving in sufficient quantities to be widely available. The first regular trade in sugar to Britain began in 1319 when some Venetian traders started regular shipments. Shipments were erratic and it was also very expensive and therefore out of the reach of all but the richest. One of the earliest mentions of sugar in Britain was in 1226, when the Mayor of Winchester held a banquet for King Henry III. The Mayor was charged to provide 'three pounds of Alexandrian sugar, if so much is to be found'.<sup>1</sup>

By about 1500, sugar cane had become widely known, extensively cultivated and actively traded south of the 35th parallel. Often grown as a garden plant, it was also used as a medicine. The Dutch East India Company began shipments from Java and nearby countries to Europe from about 1615.

Sugar cane was first introduced to the New World by Christopher Columbus who took some Canary Islands plants on his second voyage in 1493. It quickly flourished all over the Caribbean, which was known as the Spanish Main at that time. After Britain's acquisition of the Caribbean in the middle of the seventeenth century, the industry continued to grow and sugar soon became an important export to Britain. There was a large demand for it since, up to then, the quality of the sugar in Britain was very bad; most of it came from Morocco and it was frequently unusable. This severely restricted consumption growth and led to widespread complaints to the government. Approximate growth of cane production in the Caribbean area and Brazil is shown in Table 1.1.

By 1700, things had greatly improved; both Britain and France were actively encouraging the planting of new stronger variations and strains of cane from both the Mediterranean and the Far East.

The cultivation of sugar cane is labour-intensive and the experiment of shipping British agricultural labourers to the Caribbean to work in the fields was not a success. The climate proved too much for them. Spanish and Portuguese workers absconded and set up shops and so the only answer to the labour shortage was indented labour from West Africa. These slaves were shipped in their thousands to the West Indies in the most appalling conditions, although, to be fair, the sailors at that time were only marginally better off.

A flourishing three-way trade developed with textiles, toys, etc,

<sup>1</sup> Hugill A, *Sugar and All That – A History of Tate and Lyle*, Century, London, 1978.

*Table 1.1* Approximate growth of cane production in the Caribbean area and Brazil, tonnes

	1750	1770	1790
Cuba	NK	NK	17 000
Jamaica	25 000	40 000	61 000
St Dominique (Haiti)	30 000	60 000	80 000
Leeward Islands	20 000	20 000	20 000
Windward Islands	NK	21 000	30 000
Brazil	20 000	20 000	21 000
Suriname	8 000	6 000	9 500
British Guiana	NK	3 500	NK

Note: Totals are approximate and have been rounded. NK = not known. Sources: Noel Deerr, *ISO*.

being shipped to West Africa and bartered for slaves and gold dust and taken to the West Indies, from where sugar and rum was shipped to Europe. The success of this trade essentially altered the pattern of production around the Mediterranean. Apart from Egypt and parts of Spain, it had disappeared completely by the end of the eighteenth century.

Between 1690 and 1790, some 12 million tonnes of sugar cane were shipped to Europe from the Western hemisphere but by the end of the eighteenth century the Napoleonic wars again altered the situation considerably. The superiority of the Royal Navy successfully blockaded all European ports, effectively preventing any goods from reaching them. By now, the consumption of sugar was widespread and the cost had fallen to such an extent that it was within the grasp of virtually everyone. The wars, however, quickly reversed that trend and the shortages prompted a public outcry. Cane sugar production in 1800 is shown in Table 1.2.

Shortages led to the arrival of sugarbeet. About 50 years earlier in 1748, a German scientist, Andreas Sigismund Marggraf became the first person to discover the presence of sugar in the red and white beet plants. Not being a businessman, Marggraf failed to recognize the commercial implications of his discovery and it was left to Franz Carl Achard to follow it up. By 1799 Achard's experiments had advanced sufficiently to persuade King Frederick William III to build, at his own expense, a beet factory in Silesia, which opened in 1801. Europe's first commercial sugarbeet factory had been built two years earlier in Bohemia in Austria-Hungary.

But this, too, failed for lack of business acumen. However, by this time, several others had started up and were actively engaged in production. It had also spread to other countries, notably France,

Table 1.2 Cane sugar production in 1800, tonnes

India	12 000	Leeward Islands	17 000
China	NK	Windward Islands	24 000
Java	6 000	Mexico	16 000
Mauritius	3 000	Brazil	21 000
Cuba	29 000	Peru	7 500
Jamaica	71 000	Suriname	7 500

where, by 1811, thanks to official action and encouragement, a thriving industry had been established. Napoleon decreed that French farmers grow sugarbeet and by 1813 there were over 300 factories in operation, providing some 7.7 million lb of sugar. However, the Treaty of Paris in 1814 reopened French ports to colonial sugar, causing the temporary collapse of the industry throughout most of Europe. Nevertheless, it revived from about 1830 and by 1850 there were thriving industries in France, Germany, Russia and Austria-Hungary, see Table 1.3.

Table 1.3 Beet sugar production 1840-80, 000 tonnes

	1840	1850	1860	1870	1880
Austria-Hungary	4	17	77	213	533
France	30	76	101	282	331
Germany	14	53	127	263	594
Russia	NK	13	26	125	304

Note: NK = not known. Sources: Noel Deerr, *ISO*.

In Britain, however, attitudes were somewhat different. Powerful vested interests both at home and abroad were extremely hostile to any advancement in beet technology as they saw it as a threat to the extremely lucrative livelihood they were enjoying. Despite this hostility, two Quakers opened a beet factory in Essex in 1830 and a second one started up six years later.

Being fervent anti-slavers and taking advantage of the growing anti-slavery movement, these pioneers labelled their product: 'Home-grown sugar - not made by slaves'. However, they could not compete with colonial suppliers and both ventures soon ended in failure. Apart from one brief attempt in 1870, no further developments occurred until 1912 when beet cultivation was perceived to be a sensible precaution in the light of a deteriorating European situation. Britain's first commercial beet factory opened in Norfolk in that year. In 1914, Britain depended upon continental suppliers for three-quarters of total sugar consumption.



Sugar production was one of the oldest industries of the old Russian Empire, emerging at the beginning of the nineteenth century. By the time of Napoleon's invasion in 1812, there were four beet plants in the country. By the middle of the century, the main centre of activity shifted to the Ukraine where over three-quarters of the beet crop was then grown. This continued until the revolution. A smaller centre developed in the black-soil region further north.

Yields were lower than in the rest of Europe and fluctuated widely despite the fact that extraction rates were similar. Yields increased 25% in the period immediately preceding World War I. The agrarian revolution of 1917-20 completely devastated the industry, destroying the large estates on which it was based.

Before World War I, production exceeded two million tonnes but by 1921-22 it had fallen to a mere 57 000 tonnes and did not recover to pre-war levels until the 1930s. In the 1920s and 1930s the industry expanded to the eastern region of the USSR, as far as the climate allowed. Sugarbeet cultivation under irrigation was also introduced in the warm but dry regions of Central Asia and Transcaucasia. During this time, Ukraine's share of the market fell from its peak of 84% in 1921 to less than 70% by 1935.

At the end of the eighteenth century, with Florida, Louisiana and Texas under Spanish rule, there was no sugar production in the USA. After a hesitant start in the early 1800s, a disastrous fall in the price of sugar and a substantial rise in the price of cotton caused farmers to switch to the latter. However, it soon revived and, by 1853, production passed the 200 000 tonne mark. At the start of the Civil War, production had reached 240 000 tonnes, but by the end of it, in 1864, had fallen to only 5000, largely due to the desertion and impressing into the army of the slaves needed to cultivate the cane. This was quickly followed by the emancipation of slaves in the southern states, so recovery was very slow. Output in 1880 was still less than half the level of 1854.

As was the case in Europe, the US beet industry suffered a slow start and it did not become permanently established until 1890, when the Alameda Sugar Company of California was formed.

Throughout the nineteenth century, the development of cane sugar industries in Africa and Oceania, as well as in the Western hemisphere, was a continuous process, evolving steadily, adapting to technical innovations and combating the competition from beet. In the Western hemisphere, the development of Cuba at this time was one of rapid economic progress and sugar production grew from 29 000 tonnes in 1800, to over 700 000 tonnes in 1868. Possessing the first steam engine in a cane sugar factory, 25 mills were steam-driven