

the 1960s 80% of the chocolates and confectionery produced in the USA was packaged as countline goods. This trend has since continued in other markets.

In recent years the influence of the environmental movement has tended to lead to a reduction in the amount and thickness of the packaging material used, coupled with a preference for the use of degradable or recyclable packaging materials where possible. Some materials are now available, particularly for boxed chocolates, which will in fact degrade with moisture over a relatively short timescale.

30.1.3 Processing

Probably as a result of the influence of Mosimann (1963), ultrasonics was considered likely to find a major role within the confectionery industry. It was thought to be able to take part in the emulsification, particle comminution and conching of chocolate. At present the use of ultrasonics as a solid fat monitor appears to be the most commercially viable application (see Chapter 15).

30.2 Present position

This section looks at some of the developments which have taken place over the past 50 years and which were not reviewed above.

30.2.1 Materials

The source and quality of the basic raw material of all chocolate, cocoa has been changing dramatically over the period. The Ivory Coast has become by a long way the dominant supplier of cocoa to Europe, whilst owing to cocoa disease Brazil has changed from being a major exporter of beans to having to import some cocoa products. Sustainable and ethical sources of cocoa are becoming increasingly important to the industry (see Chapter 2) as are varieties with distinctive flavours.

Each cocoa origin provides its individual flavour, and thus the overall flavour of some chocolate is changed as new sources and types of beans are introduced. It is interesting to note that at least four authors have stressed the importance of obtaining high-quality properly fermented and dried beans, also noting that processing is at present unable to overcome any defects. It is, therefore, of great concern to many manufacturers that changes in the source of cocoa should not lead to a deterioration in quality.

One of the main areas of development of new ingredients has been in the low calorie or sugar-free markets. New sugar substitutes (see Chapter 4) are not the only area being developed. By adding a long chain, difficult to digest, fatty acid with two smaller chain fatty acids it has been possible to produce triglycerides with only 4 cal/g compared with the normal 9 cal/g and with adequate crystal structure. Commercial fats such as “Caprenin” and “Salatrim” have led to

many new products entering the marketplace, even if currently they are largely incompatible with cocoa butter (Talbot 2009).

Other fats have also been developed for specific purposes. One Japanese product produces a “chocolate” which bends like rubber, whilst several fat manufacturers sell fats which improve heat resistance by dramatically reducing bloom formation. Many of these are, however, only legally permitted in a few markets. Emulsifiers, such as fractionated lecithins are now widely available, whilst others such as PGPR (see Chapter 11) are permitted in most markets. A large percentage of lecithin was obtained from soya, some of which is obtained from genetically modified crops. With the European customer’s demand for GM-free ingredients, this has led to the manufacture of lecithin from soya from new sources, or from new crops such as sunflower, or to develop alternative emulsifiers.

30.2.2 Processing

Here many changes have occurred in the field of roasting, with the roasting of whole beans often being replaced by nib or even cocoa mass roasting. The thin-film or batch devices developed to do the latter have also been used to reduce conching times and/or change the flavour of the chocolate. The conches themselves have tended to become bigger, while the use of the long conche has almost disappeared altogether (Bolenz, 2014).

Overall there has been a movement amongst the larger manufacturers towards large-volume processing lines, which are operated as far as possible in a continuous manner. The installation of advanced computer control and instrumentation has also resulted in a vast reduction in the man-hours required per tonne of chocolate produced (see Chapter 24). The processing of the vast majority of the world’s cocoa is carried out by about half a dozen companies and there are increasingly fewer factories actually making chocolate, although probably an increasing number using it. This was emphasised by Jeffery (1997) who said that “in the United States there are perhaps only 15–20 makers and literally hundreds of companies ‘adding value’ to it in producing an enormous variety of confections”. In this edition a new chapter has been added which looks at the problems and advantages of this type of artisan company (see Chapter 18).

Many of the more recent innovations have, in fact, been concerned with chocolate usage, for example to make it into a mesh or to convert a standard moulding line to produce filled product without the complexity of a full shell moulding plant. It is interesting to note that the ideas behind two of the latter, that is “single-shot” depositing and the frozen cone/plunger method, originated more than 40 years ago but have only more recently become widely available as commercially built plants. This has been very much helped by the greatly improved process control techniques which are now available (see Chapter 24) and which are playing a vital role in the industry today.