

23.7 Cocoa butter pressing

This process involves the blending of select chocolate liquors to successfully separate the component parts of chocolate liquor – cocoa butter and cocoa press cake Figure 23.6. Hot chocolate liquor is fed into hydraulic presses that remove a predetermined percentage of the cocoa butter, leaving behind a press cake that may contain 10–24% cocoa butter. The cocoa cake must be evaluated for total fat content and the presses monitored for operational integrity of the screen quality and cocoa butter clarity. The cocoa butter is then filtered to a golden yellow colour and stored in tanks for use in chocolate manufacturing. It may also be shipped in liquid tankers to other chocolate factories or in moulded form to small users of cocoa butter. Cocoa butter is unique among vegetable fats because it is a solid at normal room temperature and melts at 32–34 °C (90–93 °F), which is just below body temperature. It is very resistant to oxidation and rancidity making it very practical for long shelf life products. Critical tests for cocoa butter would be FFA and moisture. Target levels of <1.75% FFA and <0.1% moisture are standard for the chocolate industry.

Deodorisation of cocoa butter through steam distillation may also be performed for the manufacturing of white chocolates or to take away flavours that are undesirable and not beneficial to the final flavour of the chocolate being manufactured (see Chapter 3). Quality parameters include FFA by AOCS Ca 5a-40 and Lovibond colour measuring the colour of liquid oils and fats in terms of Lovibond red, yellow, blue and neutral units (AOCS Method Cc 13e-92). Melting characteristics are also critical to the temper ability of the cocoa butter. The “degree of hardness” or the “melting and crystallisation properties” of a cocoa butter are commonly measured using the Jensen cooling curve methodology.

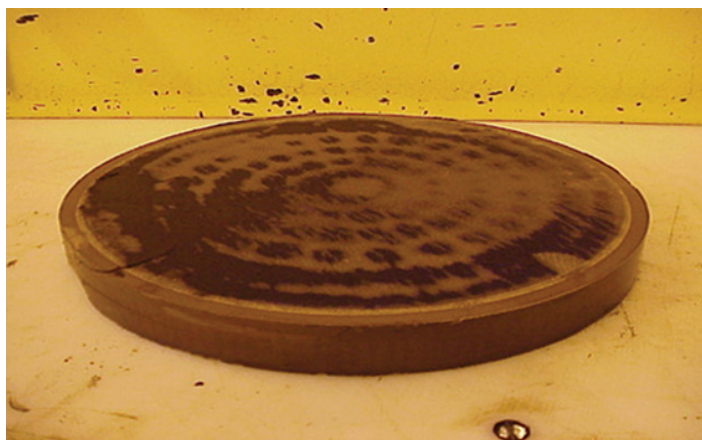


Figure 23.6 Cocoa press cake.

23.8 Cocoa powder

The co-product of cocoa butter pressing is cocoa powder. The press cake remaining after a portion of the cocoa butter is pressed out of the chocolate liquor can be ground into fine cocoa powder. Cocoa powder is defined in 21 CFR Part 163 as the food prepared by pulverising the material remaining after part of the cocoa fat has been removed from ground cocoa nibs. Alkalisation of cocoa powder can also be performed to adjust colour, pH, and flavour of the cocoa powders. Powders can range from very light in colour to brown to red to black (Figure 23.7). Cocoas are used in many industries today to enhance special characteristics to make chocolatey products for the bakery, confectionery, dairy, beverage and nutraceutical industries.

Cocoa powder final testing consists of microbiological and physical testing. Aerobic plate count, coliforms, *Escherichia coli* and possibly Enterobacteriaceae, yeast, mould and *Salmonella* are required microbiological tests. Physical testing would include pH (AOAC Official Method of Analysis 970.21 pH of Cacao Products), colour either visual or by colorimeter, percentage fat (AOAC 963.15), moisture (AOAC 991.02) and particle size (% through a 200 mesh screen). Colour and pH will vary based on the actual cocoa powder and whether it has gone through an alkalisation process. Total fat will range from 10–12% most commonly; 15–17 and 22–24% fat are less common. Moisture would be <5% and a typical particle size is >99.0 to 99.5% through a 200 mesh screen – again cocoa type and final product usage will dictate physical requirements.

23.9 Chocolate manufacturing

The chocolate factory will manufacture milk chocolate, semi-sweet, sweet chocolate or white chocolate, using specifically selected raw materials following vendor approval programmes. The CFR specifies the following permitted ingredients for “chocolate” with other optional ingredients:



Figure 23.7 Various cocoa powder colours.