

of 0.8...1.2 mm diameter). When passing these disks, cheese strings develop (feed rate 6 mm/s), which are cut 30 times/sec by knives, resulting in a fine milling.

6.2.2.4 Weighing and blending of raw material

In small- and medium-sized processing plants, weighing containers consist mainly of plastic and metal, which can be cleaned easily, stacked nicely and transported safely to the blending devices. In larger entities, weighing is done automatically, and transfer of product into the blending unit is done by transport belts.

There are different weighing procedures. Increasingly, each individual cheese variety is shredded on its own and stored for intermediate storage in its own container. Storage of raw material consisting of several cheese varieties requires a corresponding number of containers. Composition of melting batches is done by weighing of individually cheese batches, which have been milled into fine particles.

Preferably two pre-blenders are used, with one being discharged, and the other one being filled. Their capacity should correspond to a production output equivalent of 2 hours. Insufficient preblending can result in considerable variations in the consistency of the melt. Too long storage in blending containers facilitates occurrence of oxidation, resulting in a rancid flavour and taste.

Preblending devices, subject to design and layout (vertical or horizontal design), are charged and discharged automatically. After determination of dry matter content and pH of the blend, calculated quantities of water and emulsifying salts are added and incorporated. In this way, good homogeneity of the melting raw material is achieved, also resulting in a better maceration of casein. Older and strongly creaming raw material does not require any of these additives in a pre-blender.

6.2.2.5 Processed cheese composition – formulas – calculations

Premixed raw material still requires incorporation of emulsifying salts and other ingredients as necessary. In general, adjustments in fat and dry matter content are required. For this purpose, exact analytical data (fat and moisture content) for melting material and other ingredients are required. Furthermore, pH-value and buffering capability as well as their reactions with other ingredients need to be known when establishing the composition of the melt. Emulsifying salts are prepared based on an existing recipe, or they are provided by the manufacturer of emulsifying salts.

Raw cheese always has some minor variations in fat- and moisture content. Samples are taken and analysed on a random basis only. For safety reasons, prescribed values for *fdm* and *dm* should have a margin of +1%. When formulating the composition, it should be considered that when adding required emulsifying salts (2.5...4.0%), as well as adding other fat-free ingredients (skim milk powder, whey powder, casein, caseinate, whey protein concentrate and others), fat content in dry matter of the raw material blend will be decreased, as is shown in the following example.

Composition		Dry matter	Fat	<i>fdm</i>
Cheese blend	100 kg	65 kg	30 kg	46.1 %
Emulsifying salt	3 kg	3 kg	-	-
Composition	103 kg	68 kg	30 kg	44.1 %

Incorporation of 3% emulsifying salts resulted in a decrease to 44.1% *fdm* from 46.1% *fdm* = 2.0%