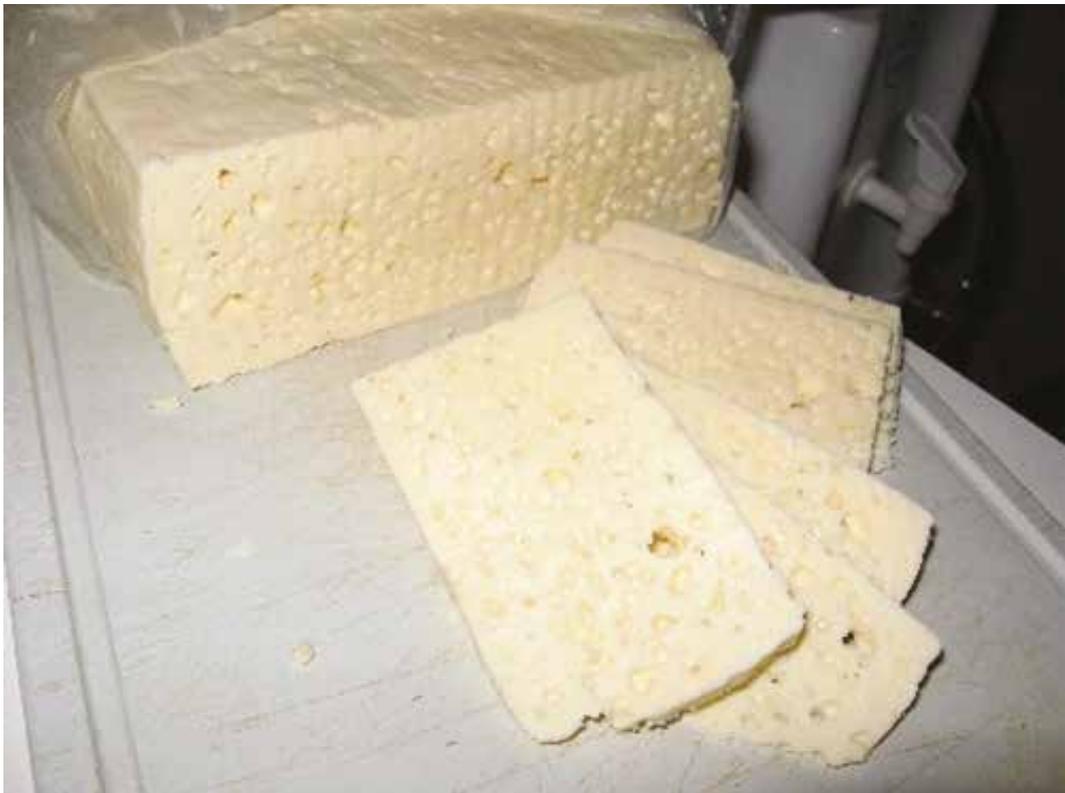


# COALHO CHEESE





## Milk Processing Toolkit



### COALHO CHEESE

#### 1.- Coalho Cheese - General Information

The Coalho-type cheese is widely produced in under developed Brazilian states, especially on northeastern Brazil. Besides being easily accomplished, its production requires low cost. This cheese is marketed throughout the country. Its great consumption is mainly observed in several Brazilian beaches, under the form of grilled cheese.

It is a semi-hard, white-colored cheese showing a typical opened texture with mechanical eyes, salty flavor and slightly acid. During the elaboration process, however, there are wide variations (i.e. cooking temperatures, salting methods, use or nonuse of lactic cultures, size of the curds after cutting with knives, etc.) with consequent changes in its physiochemical composition.

It can be found under varied sizes and forms (long wood sticks from 100g to blocks of 8 kg, approximately), either with regular and irregular small eyes or without them. This is a cheese totally addressed to the direct consumption market.

The main characteristic of this cheese is to have a well mineralized mass (high pH) for suffering an interior melting, therefore generating an external rind. Generally, the cheese should internally present a more tender mass, that it is recovered by a fine brown-colored pellicle.

The average production of the Coalho-type cheese ranges from 8.5 to 9.5 L milk by each kilogram of cheese, by using milk with 3.1 to 3.3% fat.

Average expected composition of the Coalho-type cheese (after salting)	
Moisture	42 - 48%
Total solids	52 - 58%
Fat	23 - 27%
Fat in the dry extract	40 - 52%
Sodium chloride	1,5 - 2,5%
pH	5,6 - 6,3

## 2.- Coalho Cheese processing

### Coalho Cheese Processing



### 2.1.-Addition of Calcium Chloride

The addition of calcium chloride is necessary due to insolubility of a part of milk calcium at the pasteurization process. The calcium establishes a bridge among the micelles of paracasein, by forming a net: the curd milk.

After pasteurization, some 10 to 20 grams of calcium chloride are added for each 100 liters of pasteurized milk, for this milk to reduce the coagulation time to the same time required for the raw milk. In practice, the adopted proportion is 40 mL calcium chloride for each 100L milk, under the form of 50% aqueous solution that was pasteurized and cooled.

### 2.2.-Addition of Starter Culture

The starter culture is an important ingredient in the production of cheeses. It is used with three basic purposes: the acidity development, the formation of eyes as well as the formation of flavor and aroma

The starter culture may be added under two ways, as follows. a) By adding the endogenous starter culture (E.S.C) - the amount of E.S.C is 1% of the processed milk, that is, 1 L of E.S.C. for each 100 L pasteurized milk; and b) by applying fermented whey, that is, the whey obtained from the production of the Coalho-type cheese from the previous day. The used amount is 3L whey for each 100L pasteurized milk. After addition of the starter culture, the mixture should be stirred for 2 minutes.

### **2.3.-Addition of Rennet**

The coagulation of the milk is processed at the temperature range from 32 to 35°C.

The rennet strength is considered as the amount of rennet needed for coagulation of the milk at 35o C for 30 to 40 minutes.

The used amount of the powdered rennet is 2.5 grams for 100 L milk, whereas that of liquid rennet is from 10 to 20 mL for 100 L milk.

After addition of the ingredients, milk is kept in rest by 40 to 45 minutes for processing the coagulation. At this phase, the vat must be covered with plastic in order to protect milk from impurities of the environment as well as to maintain the temperature.

### **2.4.-Cutting**

When the curdled milk shows a firm and bright aspect, it is said that it reached the cutting point. In practice, the cutting point is observed, by introducing a stainless steel knife or spatula into the clot and slowly lifting it. If the clot presents only one cut toward the knife or spatula, it is said that the clot reached the cutting point. The cut of the clot is performed with knives from 1.5 to 2.0 cm spacing in order to obtain uniform curds. First, the horizontal knife is used and the cut is longitudinally performed. Then, the vertical knife is used and the cut is first performed to the longitudinal direction, and later toward the transversal one. It also possible to accomplish rotation movements with the horizontal knife. After cutting, the curds are left in rest for 5 minutes for acquiring the necessary firmness required for the stirring process. As lower is the size of the curd as higher will be the drainage of the whey, consequently the best will be the texture of the Coalho-type cheese.

### **2.5.-Stirring**

The stirring should be initially performed with light movements with a fork or stainless steel paddle, and gradually increasing the speed for about 25 to 30 minutes.

### **2.6.-Stirring and heating the curds**

The heating can be accomplished under two different ways as follows. a) Addition of water and heating: to restart the stirring at higher speed and at the same time to incorporate slowly the hot water (70 to 75°C) as it would be a short shower. The amount of hot water should represent some 15 to 20% of the initial milk volume, which makes possible a heating up to 45 - 47°C. b) Indirect steam heating: it is the most used process. The heating should extend slowly up to 45 - 47°C, through steam injection into the jacket of the preparation vat.

### **2.7.-Curd reference point**

The final point of the curd is very variable, depending on the desired moisture content. The reference point usually occurs at 60 - 70 minutes after cutting the clot.

### **2.8.-Draining the whey and salting**

When the curd point is reached, all whey must be drained and the salt must be directly incorporated into the mixture (mass and whey) at a rate from 2 to 3% in relation to the initial volume of the milk. Salting is performed, by directly adding the refined salt into the mass, and constantly mixing. The amount of salt

used in the Coalho-type cheese is 0.5 to 1kg salt for each 100 liters of milk. Soon after, the curd must be well stirred in order to mixing the salt completely.

## 2.9.-Moulding

After salting, the final removal of the whey and the placement of the mass into the moulds are accomplished. Following, these moulds will be subjected to the pressing process. The moulds are made of plastic material and are specifically for cheeses weighing from 1500g to 3000g. The moulds are coated with either cotton screen or fine cloths in order to facilitate the formation of the rind in cheeses.

## 2.10.-Pressing

The first pressing is made in vertical-type press with 15kg weights for 15 minutes. The second pressing is made after turning the cheeses down in the moulds and inverting their order in the press for an additional period of 15 hours at the same pressure of 15 kg.

## 2.11.-Ripening

The cheese lot is identified and stored in cold room at a temperature from 10 to 12 °C and air humidity of 75 - 80% for drying and ripening. The cheeses should be turned down every 24 hours during the first 10 days under ripening in order to obtain a product with thin rind and uniform coloration. At 10 days under maturation, those cares are taken each 2 or 4 days. The surface of the cheeses must be cleaned with drinking water and they must be turned down.

## 2.12.-Packaging and storage

After the ripening period, the cheeses should be vacuum packaged in thermocontractible plastic bag and stored in refrigerating room (4 oC) until the moment for dispatching the product. Another option consists of using the vacuous technique to packing the cheeses after 10 - day period in the ripening room. The packing processes are highly variable. To supply the market, sometimes the cheeses are fractionated by hand or machines. Today, there is an available pneumatic equipment that is appropriate to the production of Coalho-type cheese in long wood sticks.

