Attachment D.1.3 - Casein Production

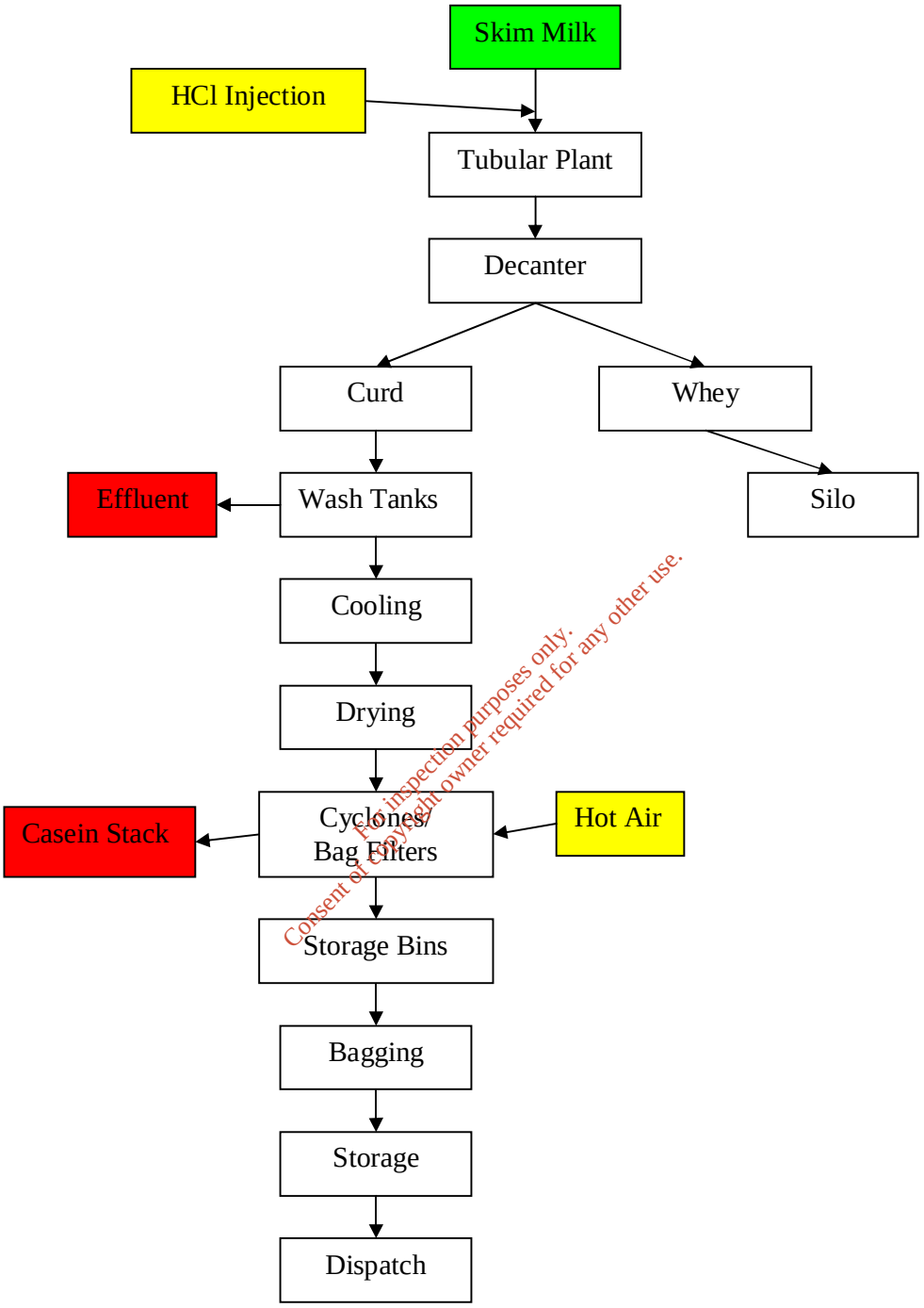
Description

The skim milk is pumped from the separation area to storage silos where it is continuously chilled while it awaits production. Casein is essentially protein that is derived from milk.

With the addition of acid until a critical pH is reached the precipitation of the milk protein (curd) begins to occur. The curd is then removed from the intermediate by a decanter. This is actually done by the use of a centrifugal system and the by-product left behind is whey. The curd is then washed several times and the water removed and filtered to remove any casein fines (particulates).

The curd is subjected to high temperatures in a casein dryer and dried to a fine powder and is packaged in 25kg or one tonne bulk bags in the form of casein powder. It is then stored onsite until retail and further shipping is required by the customer (usually within mainland Europe or the USA).

Flow Diagram



Process Controls

Control Parameter	Control Equipment	Control Method
Product Temperature	Thermometer	Automatic PLC
Steam Pressure	Pressure Gauge	Automatic PLC
Product Flow	Flow-meter	Automatic PLC
Product Volume	Ultrasonic Head Measurement	Automatic PLC
Drier Temperature	Thermometer	Automatic PLC
Solids		
% Moisture	Lab methodology	Manual
Sediments	Lab methodology	Manual
Microbiological Status	Lab methodology	Manual
Air Pressure	Pressure Gauge	Manual
Product Quality	Lab methodology	Manual
Weight	On-line Scales	Automatic PLC

Potential Emissions / Abatement

A main emission from the casein process is the wastewater generated during the cleaning of the Casein Plant. This includes the wastewater generated during the washing of all silos associated with the casein process. The wastewater is taken via effluent drains on the site to the Wastewater Treatment Plant. There is a flow meter that measures all daily wastewater flows from the Casein / Whey Processing Area of the site and this collects all washings from the Casein Area.

A second emission from the casein process is the emission to air of particulates from the casein dryers. There is abatement on these dryers in the form of bag filters, which mean that the emission of these particulates is almost negligible.

Throughput

The throughput of skim milk through the casein plant ranges from 32,000 litres per hour to 40,000 litres per hour.

Lab Facilities

Lab tests associated with casein are:

1. Micro – TBC, Coliform, Thermophiles and Pathogen Testing.
2. Chemical Testing – Moisture, Sediment, pH, Acidity.