EGG

Typical end products
Egg white, egg yolk, whole egg, egg powder.

Chemical curve: R.I. per BRIX at Ref. Temp. of 20 °C

Introduction

The egg processing operation separates eggs into different egg products: egg white, egg yolk, whole egg and several mixes, e.g. by adding sugar or salt. The pasteurized liquid egg is either packed as a final product or, in case of powdered eggs production, it goes via pipelines into a spray dryer plant.

It is very important to verify the concentration of the final egg product. This enables the supplier to assure customers that the products coming out of the processing plant meet the specifications.

Strict hygiene control is essential throughout the production process to ensure there is no contamination of the products. During the egg refining process the mass is tested several times to insure that all the products are clean. When the product is ready, it must be stored at a temperature of 4 °C (39 °F). The storage temperature required for egg yolk is 12 °C (54 °F).

Application

The eggs are fed in to a cracker/separator, where each egg has its own cup. Then, the egg shells are cut and the egg white flows off the cup while the yolk is retained. Usually there is a separate pipe for each product, leading to separate open tanks.

The egg white, the yolk and the whole egg go through a screen before they are floated into their own containers or mixing tanks. They are screened to remove all unwanted particles. When the product is a mixture, the additives are introduced into the mixing tank.

The next phase is pasteurization. The mass is preheated through a heat exchanger before pasteurization. The yolk is pasteurized at 60 °C (140 °F) and the egg white pasteurized at 57 °C (135 °F). When the mass leaves the pasteurizer, it is cooled by utilizing the same heat exchanger, which it passed through before entering the pasteurization tank.

The pasteurized mass is stored in product tanks before it moves on for packaging. If the level of dry solids for the whole egg mass is not high enough, egg yolk can be added to increase the dry solids to the specified level before packaging.
Instrumentation and installation

Refractive index measurement is needed at different stages in this process. The most common measurement points are in-line after the mixing tank, or optionally directly in the final product mixing tank prior to packaging.

The dry solids content of the yolk, egg white and whole egg are measured before and after pasteurization. Typical dry solids content of a whole egg is 26.2 % before pasteurization and 26.0-26.5 % after. With egg yolk the values are 45.0 % and 43.0-44.5 %, respectively. For egg white 14.5-15.5 % dry solids is a typical value after pasteurization.

The K-Patents Sanitary Refractometer PR-43-A is available with 3-A Sanitary and EHEDG certifications. Therefore, it meets the stringent hygiene requirements for egg refining processes.

The measurement by the K-Patents refractometer has two important functions in egg processing. First, it replaces periodical sampling of the water to dry solids interface; and second, it provides real-time quality control measurement. Both of these, speed up production and reduce wastage.

### Instrumentation Description

K-Patents Sanitary Compact Refractometer PR-43-AC for hygienic installations in small pipe line sizes of 2.5 inch and smaller. The PR-43-AC refractometer is installed in the pipe bend. It is angle mounted on the outer corner of the pipe bend directly, or by a flow cell using a 3A Sanitary clamp, I-clamp or Varinline® connection.

### User Interface

Selectable multichannel MI, compact CI or a web-based WI user interface options allow the user to select the most preferred way to access and use the refractometer measurement and diagnostics data.

### Measurement range

Refractive Index (nD) 1.3200 – 1.5300, corresponding to 0-100 Brix.