

MASTER

Reststromen concentraat, halffabrikaat en verpakkingen in het productieproces van Riedel Drankenindustrie

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Award date:
2001

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Abstract and summary van afstudeeronderzoek bij Riedel
Drankenindustrie

**Reststromen concentraat,
halffabrikaat en verpakkingen in het
productieproces van Riedel
Drankenindustrie.**

**NIET
UITLEENBAAR**

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Abstract and summary

At Riedel Drankenindustrie, manufacturer of fruit juices and fruit beverages in cartons, a research has been done to discover the places in the production process where losses of ingredients, fruit juice and packages occur.

Summary

Riedel Drankenindustrie is a producer of ready-to-serve fruit juices and fruit beverages in cartons. In the process of preparing and packaging fruit juices, several losses occur. The losses handled in this thesis are the loss of concentrated juice, prepared juice and packages. The goal of this thesis is to discover where in the production process the losses occur and if it's possible to reduce current losses.

At this moment Riedel does not know the real losses in the manufacturing process. They calculate an estimate by comparing the received quantity with the finally produced quantity. This method makes use of a conversion rate, called the breaking index, of concentrated fruit juice and fruit juice. The used variables in the calculation differ from the used variables in practice so the estimate can't be used as indicator for the losses of fruit juice.

Manufacturing consists of four production stages,

1. Receiving ingredients
2. Preparation of fruit juice
3. Pasteurization
4. Packaging

In the first stage ingredients are received. The major part of juice ingredients is delivered in bulk, the remaining part is delivered in drums, small containers and bags. The ingredients are pumped into receiver tanks. Preparation starts as soon as all ingredients are present.

Preparation of fruit juices is a recipe driven process. Two different ways of preparing can be applied. The first method is called preparation by in-tank dilution: first, all ingredients are pumped into one tank, then the correct amount of water is added, finally the blend is stirred. The second method is called preparation by in-line dilution by means of a blender: fruit concentrates are pumped into a tank and stirred. Next, the juice is pumped to a continuous blender to add water and in some cases sugar to concentrate. The output of the blender is pumped into a buffer tank.

After preparation the juice is fed to one or more pasteurizers. The objective of pasteurizing fruit juices is to minimize microbial count and to increase shelf life.

In the final stage the juice is packed using aseptic filling machines, cap applicators, tray packers and palletizers, in that sequence. These machines are placed in a line. The Packaging Department consists of 21 of these lines, which together produce 5 packaging variants. The cap applicator glues a pouring cap on the carton. The tray packer places a number of cartons in a tray, full trays are stacked up on a pallet with a palletizer. Pallets are transported to the warehouse, where they are stored.

When a fruit juice is wrongly prepared, a package is not filled well or other problems with the product occur, there is a possibility to reject a batch of fruit juice or a pallet of packed fruit juice. When the product is rejected there are two possibilities: the first is to destroy the packaging and the fruit juice, the second is to rework the fruit juice and only destroy the

packaging. In case of rework the fruit juice will be brought in the process as an ingredient at the preparation of a fruit juice or fruit beverage.

The conclusions of the thesis are:

1. 2 million guilders annually is lost by destroying or reworking packages and fruit juice. This is the biggest cause of loss of fruit juice and packages. This is 48,8% of the total loss of packages and 63,3% of the total loss of fruit juice.
2. There are a few fruit juices that can't be reworked. They are thrown away. The costs of this loss is 102.000 – 128.000 guilders per year.
3. Due to faults in the preparation stage of production 100.000-300.000 litres of fruit juice is thrown away annually.
4. Between 153.000-192.000 litres of fruit juice gets lost because of a shortage of cooling tanks.
5. The Tetra Pak filling machines cause 88% of the total loss of packages in the manufacturing process. This loss is inherent in the filling system and cannot be controlled by Riedel.
6. The loss packages at a Tetra Pak filling machine can be divided into three causes:
 1. Preparing of packaging 232.400 packages
 2. Settings of filling machine 2.325.400 packages
 3. Breakdowns 693.000 packages

Riedel cannot control the second cause, the other two can.

Recommendations for Riedel Drankenindustrie are:

1. Feed information back to the Packaging Department about the reasons why fruit juice is reworked. The operators have the opportunities to reduce the reject of packaged fruit juice and are willing to do so, but at the moment they are not informed about this loss and can't do anything to resolve it.
2. Find out if there's a solution for the non-reworkable fruit juices.
3. Use one method to calculate the theoretical loss of fruit juice.
4. Replace filling machines of the type of Tetra Pak by other filling machines, that cause less loss of packages.
5. Reduce the amount and the period of the breakdowns at the filling machines. The loss of packages can be reduced this way.
6. Reduce breakdowns at the other machines in the filling line.
7. Motivate operators to handle packaging with more care to avoid damage.