

# **HACCP**

**case study no. 2**

**(teacher's version)**

**Fresh cream and jam gateau**

**WHO / ICD**

## HACCP STUDY (CASE 2)

### EXAMPLE OF *UNAPPROVED* HACCP PLAN FRESH CREAM AND JAM GATEAU<sup>1</sup>

**a. FACILITY**

The purpose-built factory produces a variety of decorated gateaux for sale to the retail industry. The factory is based on a large new industrial estate and produces both chilled and frozen products.

**b. PRODUCT**

The product has a fresh cream and jam filling between two sponges. It is a chilled product and must be kept below 5 °C through the distribution chain. The shelf life is 3 days from date of manufacture.

**c. MANUFACTURE**

Sponge batters are baked at 150-170 °C through a travelling oven for 18.5 minutes. They are then cooled to ambient, automatically sliced and filled. There are a wide variety of fillings for the sponges. The sponges are flow-wrapped and put into cartons.

**d. INTENDED USE**

The product is a treat for everyone at all times at all places.

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<sup>1</sup> The original study was published by: Sara Mortimer and Carol Wallace; HACCP, a practical approach, Chapman & Hall, 1994

◆ *It has been changed on purpose to include errors. It should not be used as a "good" example*

## **NOTES FOR TRAINERS**

### **CCP 1**

It is unlikely that insects are a food safety problem. Since removing insects from flour could be regarded as a Good Hygienic Practice, sieving is not a CCP.

### **CCP 2**

It is possible, but highly unlikely, that *B. cereus* in this product will cause food poisoning, nor is there epidemiological evidence that *B. cereus* would reach sufficient numbers in a few days at refrigeration temperatures to cause illness. Even a few hours at high temperatures (for example, if the gateaux are packed in a picnic basket, or served at a party) will probably not cause harm. (The description of "intended use" mentions that the product is a treat at all times and all places.) *B. cereus* is thus not a significant hazard, and flour not a CCP for this microorganism.

### **CCP 3 and 4**

In principle, the supplier controls the mycotoxin hazard. Testing for aflatoxin and coliforms can be regarded as verification of the supplier's conformance with a specification, rather than monitoring. However, when deviations from specifications are found, the incoming material is rejected, i.e. the results of testing are used to control a hazard, and as such, testing can be regarded as monitoring.

### **CCP 5**

The listed hazard is chemical contamination, without specifying which chemicals the HACCP team had in mind. Micro checks are mentioned as control measures but the critical limits refer to chemical contamination. Under monitoring, *Giardia* and *Cryptosporidium* are mentioned. These are microbes, and not chemicals, and testing for them is a specialized activity, normally not performed in factory laboratories. The water is used to make batter for the cakes, which are then heated sufficiently to kill vegetative bacteria and parasites. For this reason such microbes are not significant hazards and need not be addressed in the HACCP plan. It is questionable whether weekly monitoring would be sufficient to prevent unacceptable chemicals from reaching the consumer. Filtration and chlorination would correct unacceptable contamination with microbes, but would not rectify chemical pollution.

### **CCP 6**

It takes at least two days to test for the absence of *Listeria* with the ISO method. Pasteurized cream has a shelf-life of several days, but the product has a

shelf-life of only three days; manufacturers will be unwilling to lose two days on testing. In any case testing is not a good method to assure absence of pathogens in a product. It would be better to rely on the supplier's quality assurance. Thus, monitoring for *Listeria* makes no sense. Cream is a very critical material because it supports the growth of *Listeria* and it does not receive a heat treatment during manufacturing. Optimal hygiene and time/temperature control along the food chain are therefore required rather than testing the incoming lots.

#### **CCP 7**

Auditing the supplier once a year cannot be regarded as monitoring.

#### **CCP 8**

Moulds could indeed be a problem in this product. However, it would be a quality problem, not a safety problem. Thus, testing would not be a control measure, and this step would not be a CCP.

#### **CCP 9**

The sheet does not mention which biological growth the HACCP team had in mind. Biological growth does not necessarily lead to a safety problem. Often it is just a spoilage one, but in fermentation bacterial growth is even needed. Bacteria should therefore be specified. In this example, sensitive material is kept at refrigeration temperatures for short periods of time, so there probably is not a safety problem. Therefore, storage of raw materials should be covered by GHP. If physical contamination takes place, it is unlikely to cause a problem, because some materials are sieved and there is a metal detector at the end of the line.

#### **CCP 10**

Too much salt is a quality problem, not a safety one.

#### **CCP 11**

The pathogens should be specified. *Bacillus cereus* and *Clostridium perfringens* will survive this baking process, but *Salmonella*, *Listeria* and many other non-sporeforming microbes should be killed by the intended time/temperature. This is certainly a CCP for vegetative pathogens.

#### **CCP 12, 13 and 14**

Cooling, filling and probably cream whipping take place in a high hygiene area. Since there are no further possibilities to kill microorganisms such as *Listeria* and *Salmonella*, it is important to prevent product contamination. Air quality is important as well as cleanliness of lines and line environment. It is unlikely that *Salmonella* is a hazard in this product. Salmonellae can grow only in the whipped cream (cake and jam have too low a water activity); the product is

kept at low temperatures and has a shelf-life of only a few days. If the cakes are kept at too high temperatures for a longer period of time, which would allow the growth of *Salmonella*, the cream would probably spoil (become rancid) and the cake would not be eaten. However, it is possible that few salmonellae in a fatty material such as cream, eaten by a susceptible person, could cause illness. As such, the filling would be a CCP, but not only for *Salmonella*, also for *Listeria*.

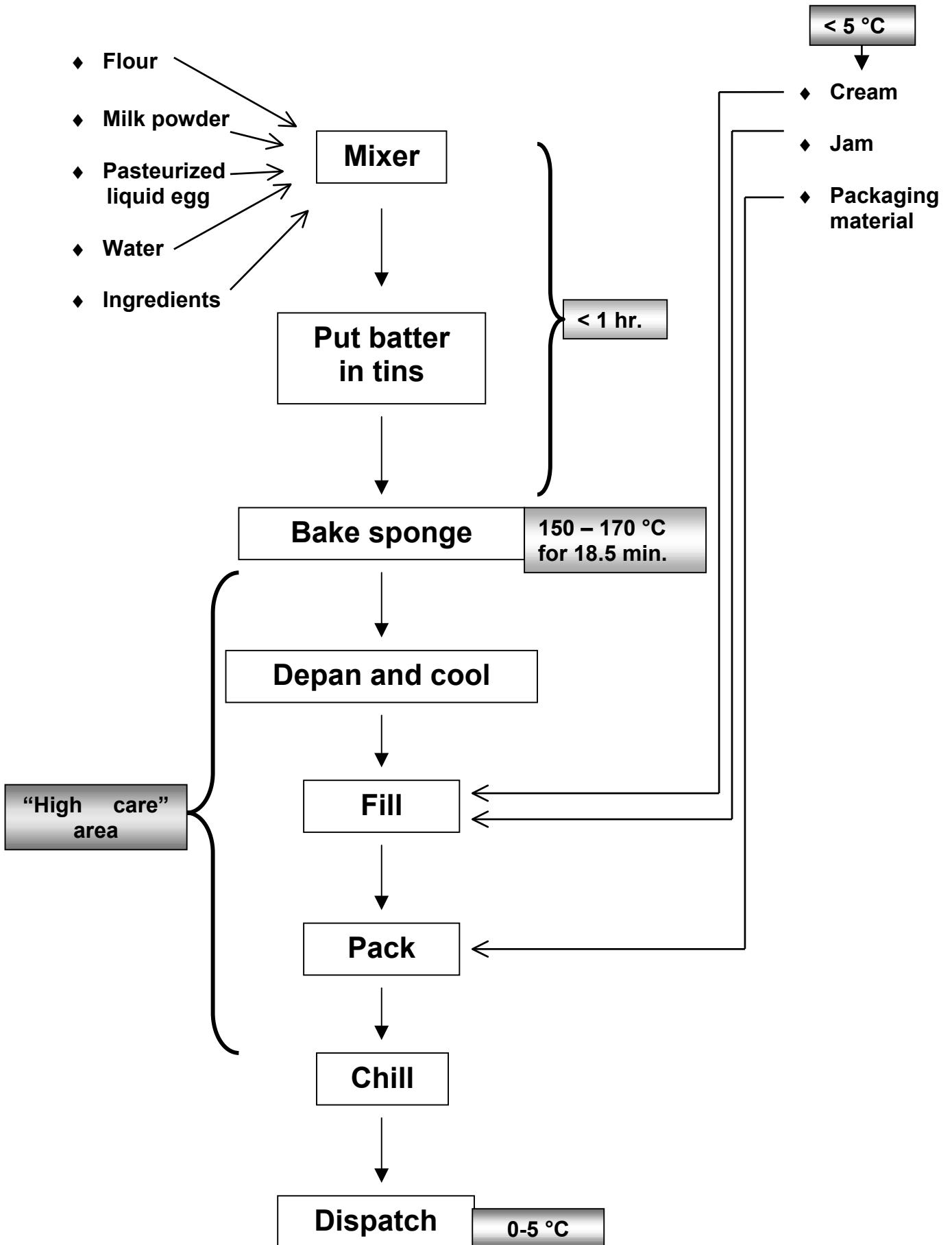
#### **CCP 15 and 16**

The pathogens that are regarded as hazards should be mentioned.

#### **CCP 17**

Two mg of ferrous metal or 2.5 mg of a non-ferrous metal in the form of a ball would not really be a physical hazard. In the form of a needle of a certain size metal is a harmful physical object. Therefore, the metal detector should be programmed to detect a needle of a certain size, rather than metal of a certain weight. A standard needle should be used for calibration.

# Fresh cream and jam gateau



Example of *unapproved* HACCP data sheet

Raw material	CCP No.	Hazard to be controlled	Control measures	CCP parameters	Critical limits	Monitoring		Corrective actions
						Method	Frequency	
Flour	1	Insects	Sieving	Pore size	2 by 2 mm	Inspection	1x per hour	Re-sieve
Flour	2	<i>B. cereus</i>	Testing	No./g	< 1000/g	ISO method	Every delivery	Rejection
Milk powder	3	Aflatoxin	Supplier QA	Aflatoxin M <sub>1</sub>	< 10mg/kg	ISO method	Every delivery	Rejection
Liquid egg	4	<i>Salmonella</i>	Supplier QA	Coliforms count	< 10/g	ISO method	Every delivery	Rejection
Water	5	Chemical contamination	Carry out on-site micro checks and obtain Certificate of Analysis of local sample-Water Authority	Regulatory requirements	Chemical contamination (see spec.) Regulatory compliance	Testing to include toxic substances <i>Giardia</i> / <i>Cryptosporidium</i> Inspect Certificates of Analysis from Water Authority	Weekly	Filtrate & Chlorinate
Cream	6	<i>Listeria</i>	Testing	Absence in 10 g	5 samples of 10 g negative	ISO method	Daily	Rejection
Jam	7	Pesticides	Supplier QA	Regulatory requirements	Regulatory requirements	Supplier audit	Yearly	Sanctions
Packing material	8	Moulds	Testing	Aerobic count	< 100/cm <sup>2</sup>	Rodac plate	Every delivery	Rejection

**Example of *unapproved* HACCP data sheet (cont.)**

Process step	CCP No.	Hazard to be controlled	Control measures	CCP parameters	Critical limits	Monitoring		Corrective actions
						Procedure	Frequency	
Storage of raw material	9	Physical contamination, biological growth	Store as specified, i.e. cream < 5°C, egg for specified max. time. Keep covered	Various	No physical, chemical contamination. Maintain temperature < 5°C	Automatic temperature recorder. Visually inspect label to ensure stock rotation	Daily checks – continue during use. Every batch	Hold and inform QA Manager
Ingredient weighing	10	Too much salt	Weighing	Weight/batch	0.2%	Sartorius	Each batch	Reprocess
Sponge baking	11	Survival of pathogens	Bake sponge at specified time/temperature	Time/temperature	Bake at 70°C for 2 min. minimum core temperature	Automatic chart recorder	Continuous	Stop production. Reject faulty product. Adjust oven temperature/time
Cooling	12	<i>Listeria</i>	Keep cooling area clean	Visible residues	No residues visible	Observation	After every cleaning	Clean again before start
Cream whipping	13	<i>Listeria</i>	Clean machine	Visible residues	No residues visible	Observation	After every cleaning	Clean again before start
Filling	14	<i>Salmonella</i>	Keep line clean	Visible residues	No residues visible	Observation	After every cleaning	Clean again before start

**Example of *unapproved* HACCP data sheet (cont.)**

Process step	CCP No.	Hazard to be controlled	Control measures	CCP parameters	Critical limits	Monitoring		Corrective actions
						Procedure	Frequency	
Flow wrapping	15	Biological contamination	Hermetic seal	No holes	Intact seal	Visual inspection	Every 15 min.	Re-sealing
Chilling	16	Growth of pathogens	Blast chilling	Time/temperature	½ hr./ 5 °C	Temperature recorder	Each batch	Rework
Metal detect	17	Metal contamination	Metal detector	Metal size	Absent – ferrous 2.0 mg, non-ferrous 2.5 mg	Metal detection check using test pieces. Calibrate metal detector	Every 30 min.  Daily	Stop line, recalibrate, notify QAM. Hold stock manufactured since previous check

## VERIFICATION

Case 2

What?	Why?	When?	How?	Action in case of deviation
Cream taste testing	Acceptance	Every batch	Triangle test	Reject
Finished product <i>B. cereus</i> testing	Check safety, < 100/g	Every batch	ISO method	Rework
Finished product <i>Listeria</i> testing	Check conformity with criterion Absence in 5 x 10g	1/week	ISO method	Find cause, Improve HACCP plan
Monitoring records review	Check adherence to HACCP plan	1/week	Inspection	Correct, Train, Improve