HACCP

case study no. 3

Flour Fried Chicken

WHO / ICD

HACCP Interactive exercise

During this exercise the trainer and trainees are together conducting a HACCP study of Flour Fried Chicken. The trainer should stimulate the questions which need to be asked, he should try to prevent as much as possible to elaborate the HACCP plan himself. The trainees are the experts, the trainer only the moderator.

Preparation of Flour Fried Chicken

A chef prepares a flour-fried chicken for a group of people according to the following recipe:

a. Chicken preparation.

Take 3 lbs. of chicken meat, wash it, and cut into several pieces.

b. Cooking

Pour ½ inch (1.25 cm) cooking oil in an electric skillet set at 350 ^{o}F (175 ^{o}C). Beat two eggs in a flat dish.

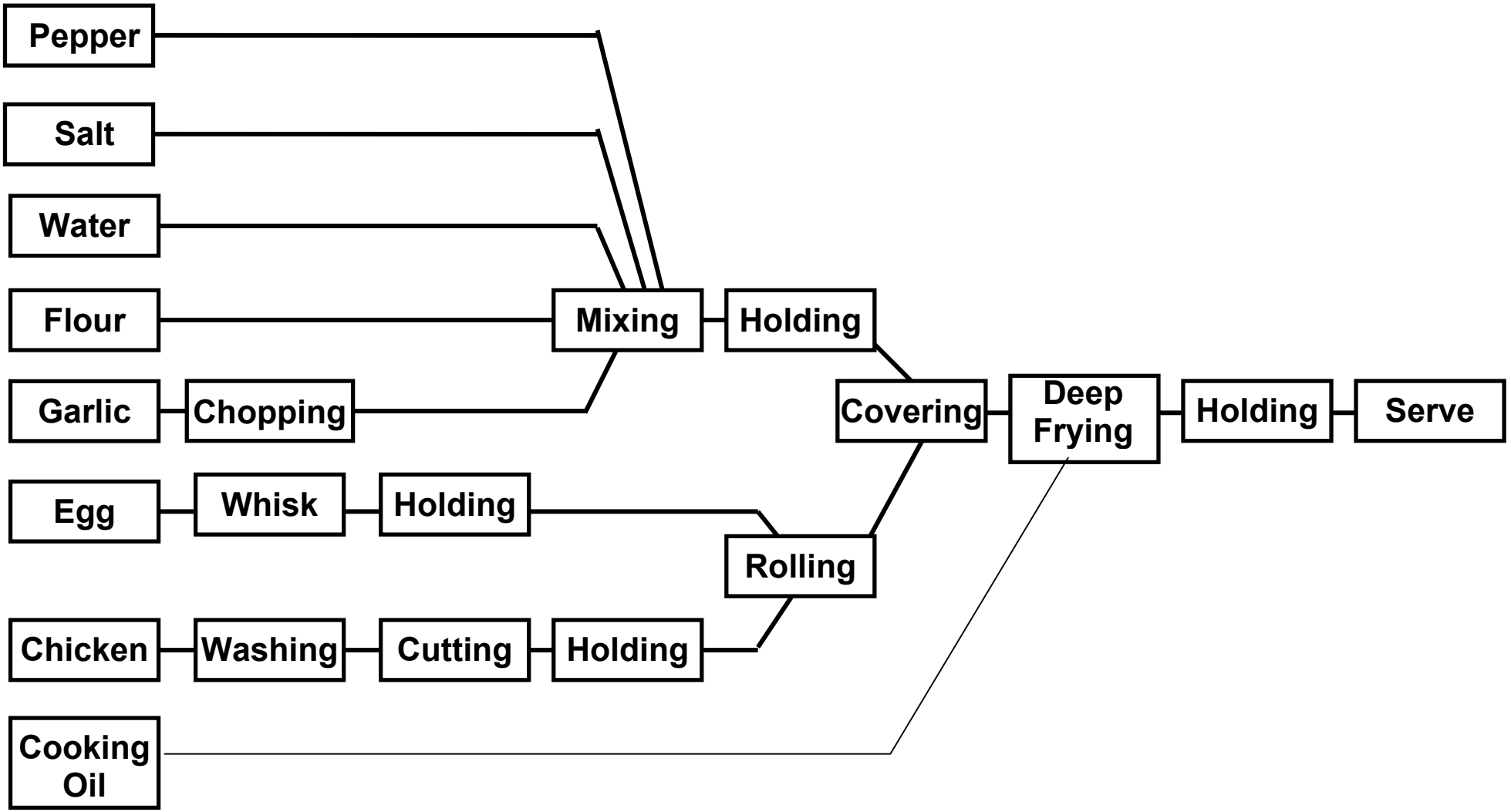
Combine ½ cup (125 ml) flour with salt, pepper and two cloves of chopped garlic in a flat dish. Add enough cold water to make a stiff paste.

Dip chicken pieces in the egg mixture, then roll them in the flour mixture to coat all sides. Drop the chicken into hot oil, cover (leave vent in lid open) and cook for about 15 minutes or until dark golden brown. Turn chicken pieces. Reduce the temperature to 300 ^{o}F (150 ^{o}C) and continue cooking, uncovered, until golden on all sides and tender, about 15 minutes more. Serve immediately.

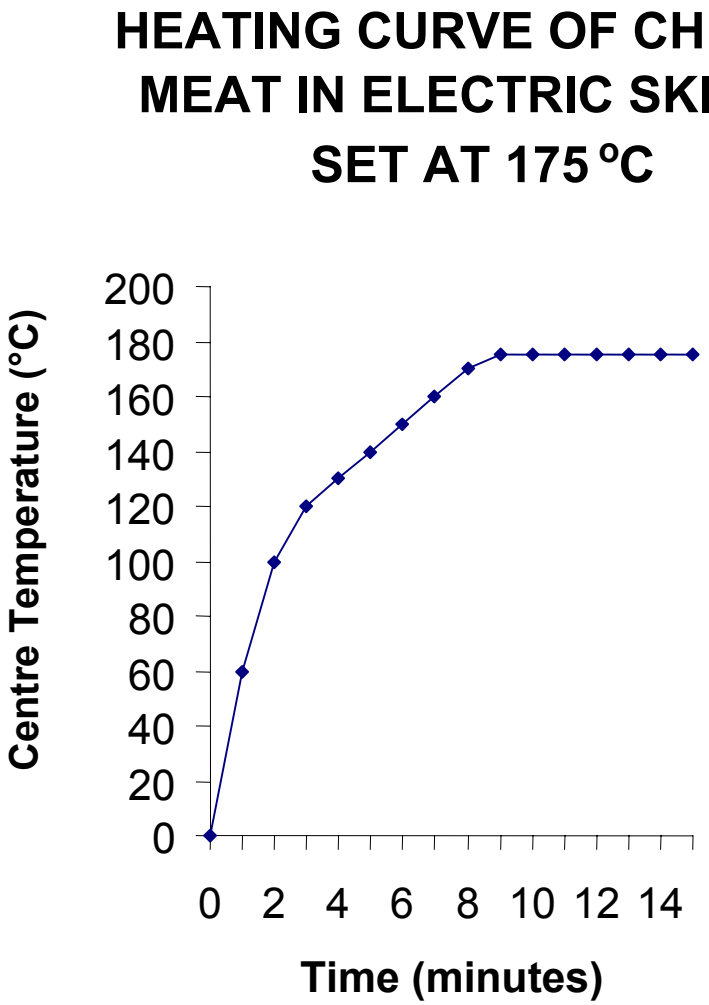
Interactive exercise

Carry out a HACCP analysis on this recipe. The teacher and the trainees have to design the flow diagram, including the raw materials and processing steps. In the preparation of the fried chicken the time and temperature necessary to render the chicken safe, is very critical. The heat penetration curve is provided but should only be shown when students ask for it. They should themselves find out that such a curve is necessary to determine the critical limits at the frying process as a CCP. They may also need to determine during which time and at which temperature the chicken could be kept before serving. At the end of the exercise the complete flow diagram, the heat penetration curve and the examples of the two HACCP data sheets can be shown and further explained.

DIAGRAM FLOW OF FLOUR FRIED CHICKEN



Temperature/Time chart for chicken



HACCP Data Sheet

Microbiological study

Point of control (raw material or process step)	**Hazards**	**Control measures**	**CCP parameters**	**Critical limit**	**Target values**	**Monitoring procedures**	**Corrective action**
Deep frying	Survival of or recontam-ination with microbial pathogen (*E. coli, C. jejuni, Salmonella* spp.)	Correct design and operation of deep frying	Temperature and time	70 ^{o}C all parts of chicken meat within 2 minutes	175 ^{o}C 15 minutes and 150 ^{o}C 15 minutes	Record the temperature and time at centre of meat	Adjust the temperature
Holding (or as GMP, can be avoided if it is consumed immediately)	Growth of and recontam-ination with microbial pathogen	Time of holding Storage condition	Time of storage Storage condition of cooked chicken	less than 4 hours No flies, cooked food should be covered	Eat immediately while still hot/warm No flies, cooked food should be covered	Record the time Observe the flies and cover of cooked food	Reheating Reheating

HACCP Data Sheet

Chemical study

Point of control (raw material or process step)	Hazards	Control measures	CCP parameters	Critical limit	Target values	Monitoring procedures	Corrective action
Pepper and onion (can be ignored since they are used in small amounts only)	Presence of Pesticide	Supplier's quality assurance	Absence of pesticide	0.1 mg/kg (Aldrin & Dieldrin in onion) 0.5 mg/kg (Chlorpyrifos in onion) 1 mg/kg (Dimethoate in onion & peppers) (Codex Vol 2,93)	No target value	Inspection, chemical testing	Rejection of suspected lots
Chicken meat	Presence of hormone and antibiotic	Supplier's quality assurance	Absence of hormone or antibiotic	Oxcytetra-cycline MRL 100 ppb or 0.3ppb/kg body weight	No target value	Supplier record inspection, chemical testing	Reject

NOTES FOR DISCUSSION

Microbiological study

From the earlier lectures we have learned that we must assume that raw chicken will always be contaminated with infectious pathogens. The CCP is the temperature at the centre of the chicken while it is cooking. This must reach the equivalent of 70°C for 2 minutes at the center. Other time-temperature equivalents are given in the Manual.

After cooking, the next CCP is to prevent recontamination, which will occur if the kitchen hygiene is poor. It is important to teach that the layout of a kitchen (or any food operation) may be crucial in the prevention of cross-contamination.

Holding time and temperature may not be critical when the chickens are served within four hours after preparation (surviving microorganisms will still be in the lag phase, and the temperature may be still too high for multiplication of pathogens). In this case it is covered by Good Hygienic Practice (GHP) and not a CCP.

The key piece of information which is missing is the chart of temperatures/times reached in the middle of the chicken.

Chemical study

While the limits for pesticides and antibiotics are correct, they are of no practical value to caterers and fast food outlets. These limits are used by regulatory authorities to ascertain the levels of agricultural chemicals in the food chain and to take action when the levels exceed the critical limits. The message for caterers and fast food restaurants is to use a reputable supplier who is aware of these hazards in the raw materials.