

ABSTRACT

Over recent years, the role of the smoke-curing of fish has changed from the former preservative action to the flavouring task. This has made it increasingly important to optimise the processing conditions to give acceptable sensory properties to the smoked fish products.

In this project the effect of the most important processing variables - drying time, drying temperature, smoke level, smoking time and salt level- on the sensory attributes of smoked mackerel were studied. The smoking and drying of mackerel were done in a Whitelock Speedy Smoke 'N' cooker - a pilot plant smoker-dryer. Humidity and the air circulation inside the smoking kiln were maintained at constant levels. The relative humidity was at 60-70% during the predrying period and 42-45% during the smoking and further drying period. The air circulation was set at 7 in the Whitelock Speedy Smoke 'N', which gave 1400 rev/minute as speed of air circulation. The processing variables were, temperature (33, 54 and 75°C), total drying and smoking time (4, 9 and 14 hours), smoke level (0.5, 2.5 and 4.5 in the smoker-dryer), smoking time (1, 2.5 and 4 hours), salting time (6, 18 and 30 minutes in 60% salinometer brine).

A series of factorial experiments were used to optimise the sensory properties of the smoked mackerel.

A taste panel was trained and a sensory profile was developed to evaluate the smoked fish. The effects of the processing variables on water activity, moisture content and salt level of the smoked fish were also determined to give some indication of the storage quality of the smoked fish. The drying rates, under the different processing conditions, were also observed. The first experimental design experiments indicated that acceptable smoked mackerel could be achieved by drying and smoking either at 33°C or at 70°C.

At 33°C the optimum conditions were;

Drying Temperature	33°C
Drying and Smoking Time	12 hours
Smoke Level	4.5 (in the smoker-dryer)
Smoking Time	1 hour
Salting Time	30 minutes (in 60% salinometer brine)

This gave smoked fish with an acceptability rating of 5.6 on a 1-7 point scale, a moisture content 64%, ERH 0.93, and salt content of 2.4%.

At 70°C the optimum conditions were;

Drying Temperature	70°C
Drying and Smoking Time	5 hours
Smoke Level	4
Smoking Time	5 hours
Salting Time	15 minutes (in 60% salinometer brine)

Under these conditions, smoked fish had an acceptability rating of 6.3 on a 1-7 point scale, a moisture content 64%, ERH 0.94, and salt content of 2.4%. The optimum levels of the processing variables proved to be satisfactory in producing an acceptable smoked fish product, under the given conditions.