

Changes in histamine levels in dried fish under different storage conditions

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Abstract

Dried queen fish (*Chorinemus sp.*), skipjack tuna (*Katsuwonus pelamis*), herring (*Amblygaster sirm*) and anchovy (*Anchoviella indica*), obtained from Trincomalee and Kalpitiya processing sites, were stored under different conditions and investigated for the rates of histamine formation over a period of time. Air conditioning (21 ± 2 °C, 72.5 ± 2.5 %RH; representing supermarket conditions) and ambient storage (29 ± 3 °C, 79 ± 7 %RH; representing retail shop conditions) were used as the test conditions with storage at ambient temperature (29 ± 3 °C, 79 ± 7 %RH) after vacuum packing as the control. Samples were analysed for total solids, water activity, salt and histamine levels at two week intervals over a period of two months.

The correlation between water activity (a_w) and changes of histamine (+0.093) levels indicated that the growth of histamine producing bacteria increased with high a_w . The correlation between salt and histamine levels (-0.063) indicated that the histamine production decreased with increase in the salt content, showing a preservative action. Vacuum packing (histamine = 289.2 mg/100 g) was a better storage method, in relation to histamine content when compared with air conditioning (histamine = 323.4 mg/100 g) and ambient storage (histamine = 367.2 mg/100 g). The growth of facultative anaerobic histamine producing bacteria (HPB) may be the reason for the histamine formation in vacuum packed dried fish whereas in the other two storage conditions, mesophilic HPB may be the cause. Species-specific effect on the development of histamine levels was evident from the findings that the values in queen fish (11.1 mg/100 g) and anchovy (39.7 mg/100 g) were significantly lower ($P < 0.05$) than in herring (152.1 mg/100 g) and skipjack tuna (1103.5 mg/100 g). Results show that formation of histamine during storage is affected by salt content, water activity (a_w), initial quality of dried fish, temperature and Relative Humidity.

Keywords: histamine, dried fish, storage, water activity, salt

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