Full Length Research Paper

Assessment of The Quality of Fresh Fish Sold in Awka Metropolis, Anambra State, Nigeria.

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ABSTRACT

This study assessed the quality of fresh fish sold in Awka metropolis, Anambra State, Nigeria. A total of four samples each from two popular species sold in the area were used. The species were Mackerel and Horse fish. Total volatile nitrogen (TVN) and Peroxide value (PV) of the samples were analyzed and the results were as follows: sample A had the total volatile nitrogen (TVN) of $11.20\pm.10$mgN/100g and peroxide value (PV) of $0.40\pm.14$meq/kg; sample B had total volatile nitrogen (TVN) of $15.12\pm.21$mgN/100g and PV of $12.40\pm.10$meq/kg; sample C had TVN content of $26.00\pm.14$mgN/100g and PV content of $16.00\pm.23$meq/kg while sample D had TVN content of $19.95\pm.78$mgN/100g and PV content of $19.80\pm.71$meq/kg. The TVN and PV contents of samples A and B were below the standard stipulated by Pearson while the TVN of sample C and sample D were slightly above the standard set by Pearson who stipulated 16.5mgN/100g and less than 20meq/kg for TVN and PV respectively. The results showed that the fish sold in Awka may be largely safe for human consumption. Further studies are required to ascertain this.
Key words: Horse, Mackerel, Total Volatile Nitrogen, Peroxide value.

INTRODUCTION

Fish is a proteinous sea food that dies as soon as it stays away from marine or fresh water surroundings and undergoes depreciation with time outside the water environment. Fish is normally inspected for the presence of parasites and diseases and also for quality assessment ,a term which usually refers to the degree of spoilage (Pearson, 1976). Food spoilage are caused by specific organisms called specific spoilage organisms (SSOs) (Gram and Dalgaard, 2002).As fish spoils , various physical changes become apparent, viz the odor deteriorates, the surface becomes dull and the slime on it becomes opaque, the flesh softens, the eye pupil becomes turbid and a reddish coloration develops along the backbone (Pearson,1976). Several methods including microbiological method are used to assess fish quality but biochemical and chemical indicators have been used to replace more time consuming micrbiologial method (Wong, 1987).The appeal of biochemical and chemical methods for the evaluation of sea food quality is related to the ability to set quantitative standards (Poulters and Nicolaides,1985).

Indicators of fish spoilage include amines (Total Volatile Basic Amines (TVBA)) which is a general term that measures trimethylamine (TMA)(produced by spoilage bacteria); dimethylamine(DMA) produced by autolytic enzymes during frozen storage; and ammonia produced by deamination of aminoacids and nucleotide catabolites and other volatile basic nitrogenous compounds associated with seafood spoilage (Rehbein and Oehlenschlager,1982). The amount of TMA and the Total Volatile Nitrogen (TVN, i.e. volatile amines and ammonia) are most commonly used for assessing the degree of spoilage in white fish (Pearson, 1976). Stamen (1990) observed that PV often useful is for assessing the extent to which spoilage has advanced.

This study aimed at assessing the quality of fresh fish sold in Awka metropolis, Anambra State, Nigeria.

MATERIALS AND METHODS
Sample Collection:
The 4 fish samples each used in the study were collected from Eke Awka main market, Awka, and UNIZIK temporary site, Awka all in Nigeria. The species were Mackerel and Horse which are commonly available in these areas.

Reagents:
All reagents used were of analytical grade.

Sample preparation:
The fish samples were cut into pieces and then dried in an oven (Gallenkamp, England) at 100°C for 3hours for oil extraction(for peroxide value determination) while the fish portion for the total volatile amine determination was minced and used immediately.

Methods:
Extraction of oil:
The soxhlet extraction method of Pearson (1976) was used for fish oil extraction.

Peroxide Value Determination:
The method of Pearson (1976) was used for peroxide value (PV) determination.

Total Volatile Nitrogen (TVN) determination:
The method of Pearson (1976) was used for Total Voltile Nitrogen determination.

RESULTS
The results of the analyses for TVN and PV for samples A, B, C, and D are expressed as mean$\pm$ standard deviation (S.D) in Table1

Table1: TVN and PV contents of the fish samples

Sample	TVN(mgN/100g)	PV(meq/kg)
A	11.20$\pm$.01	10.40$\pm$.14
B	15.12$\pm$.21	12.40$\pm$.10
C	26.00$\pm$.14	16.00$\pm$.23
D	19.95$\pm$.78	19.80$\pm$.71

DISCUSSION
The results of this study when compared to the reference values for Total Volatile Nitrogen(TVN) and Peroxide Value(PV) of fresh fish sold in Awka metropolis, Nigeria fall within the reference values (Pearson,1976). However, TVN values of samples C and D are slightly higher than the reference values by Pearson (1976). Pearson (1976) stipulated values of 16.5mgN/100g and less than 20meq/kg for Total Volatile Nitrogen

(TVN) and Peroxide Values (PV) respectively. Also Connel (1975) recommended a PV of between 10 to 20meq/kg fish using iodometric titration method.

Values of TVN and PV above the reference values are considered as an indicator of fish spoilage. Spoiled fish can cause harm to the body as a result of the presence of harmful bacteria, parasites or chemicals (Nanto, 1993).

CONCLUSION
The results obtained from this study has shown that fresh water fish sold in Awka metropolis, Anambra state, Nigeria may be largely safe for human consumption. Nevertheless, more efforts are needed on the part of regulatory agencies such as National Agency for Food and Drug Administration and Control (NAFDAC) to ensure that fish consummed in Awka metropolis, Anambra state, Nigeria are wholly safe.

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