شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومـــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

Cairo University
Faculty of Veterinary Medicine
Department of Food Hygiene and Control

HISTAMINE IN FISH AND FISH PRODUCTS AND ITS RELATION TO BACTERIA

Presented By

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(M.V. Sc. 1992)

For the degree of
(Ph.D. V. Sc.)

Hygiene and Control of Meat and their Products

Under the supervision of

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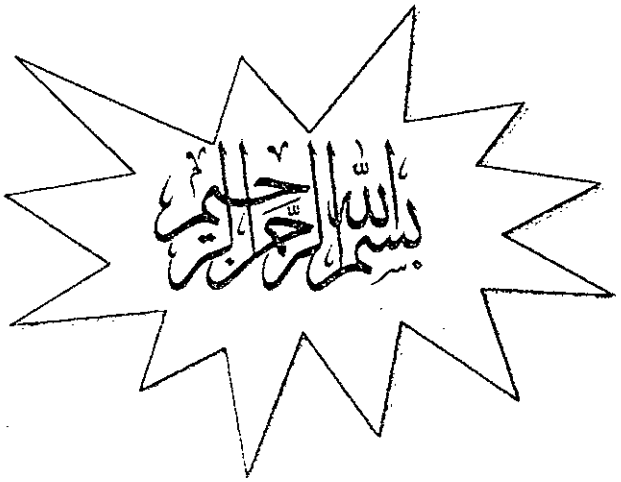
(2002)



قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ العَلِيمُ الحَكِيمُ

[البقرة آية: (٣٢)]

جامعة القاهرة
كلية الطب البيطرى
قسم الرقابة الصحية على الأغذية

بسم الله الرحمن الرحيم

قرار لجنة الحكم والمناقشة

قامت اللجنة بفحص الرسالة ووجدت أنها قيمة إذ اشتملت على بحوث هادفة و تناولت موضوعات لها أهميتها من الناحية الصحية والتطبيقية

لـــذلك

ترى اللجنة ترشيح السيدة ط.ب/ **نادية عبد الفتاح ابو سريع** للحصول على درجة الدكتوراة الفلسفة فى العلوم الطبـــية البيطرية (الرقابة الصحية على اللحوم و منتجاتها)

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و المشرف على الرسالة

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Abstract

Two hundred of fish represented fifty each of (fresh sardine, frozen fish, smoked fish and salted sardine) were collected from different markets and shops in Cairo and Giza governorates. Obtained results revealed that sensory examinations showed agreeable appearance and pH, sodium chloride, moisture content in most samples. The examined salted samples had higher total volatile basic nitrogen and histamine content while the lowest mean value was in frozen fish. The examined fresh fish samples had higher mean value of different bacterial counts than those of frozen, smoked and salted fish samples gave the lowest mean value of the previous mentioned counts. *V. parahaemolyticus* and Salmonella can not be isolated in this study. The public health significance of isolated microorganisms, histamine content, the ability of the bacterial isolates to produce histamine were discussed.

Moreover, the effect of application of potassium sorbate 0.5% and 1% concentration with sodium chloride mixture in processing salted sardines and 1% concentration potassium sorbate with sodium chloride mixture in smoked herring. Sensory chemical and bacterial counts were discussed. Potassium sorbate at 1% give the best results.

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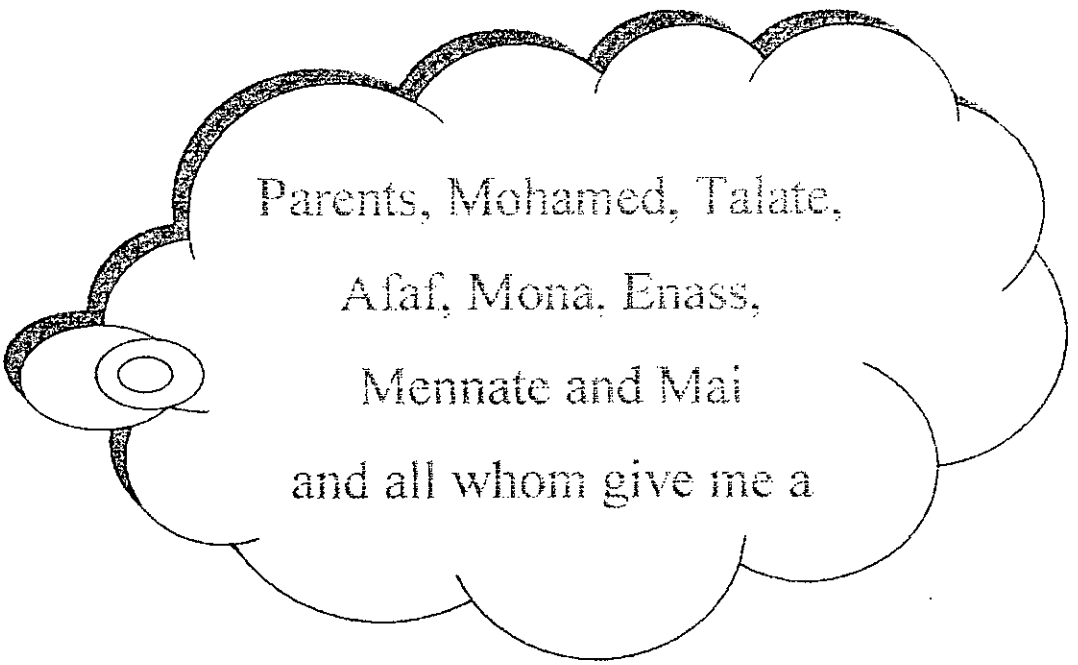
Dedicated to

My



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INTRODUCTION

INTRODUCTION

The principal amines of interest in fish may be conveniently divided into two groups: the low molecular-weight alkalamines commonly used as indicators of eating quality in lean fresh and frozen fish, and biogenic amines, which are formed from the belonging to both Scombridae (tuna, mackerel, bonito and Spanish mackerel) and Scombersocidae (Saury) and other marine fish such as *Mahi mahi* that have high levels of histidine in their muscle tissue as a result of improper handling of fish **(Arenold and Brown, 1978, Eitenmiller *et al.*, 1981).**

The formation of histamine depends on the number of microorganisms rather than on the environment (**Yoshinaga and Frand, 1982),** delayed icing, poor handling and processing of fish products and delayed salting **(Reilly and Santos, 1985).**

Several factors are known to affect bacterial growth and histidine decarboxylase activity. These include incubation temperature (**Eitenmiller *et al.*,** 1981), medium pH (**Ienistea, 1971**), the concentration of histidine and carbohydrates in the medium, oxygen tension, vitamins and coenzymes.

Most of the bacteria identified as histamine formers were Gram-negative and nearly all of which belonged to the Enterobacteriaceae family including Proteus, Enterobacteriaceae, Hafnia **(Merson *et al.*, 1974; Gruickshank and Williams, 1978 and Arnold and Brown, 1978),** Pseudomonas species, Aeromonas species, Vibrio species **(Leitao *et al.*, 1983)** and *Escherichia coli* **(Okuzumi *et al.*, 1982)**, Shigella, Salmonella and Clostridium **(Kimata, 1961)**.

Food-borne intoxication is caused by the consumption of fresh or processed fish containing hazardous levels of histamine (50 mg/100 g in tuna **(FDA, 1982)**.

Some food poisoning incidents resulting from the consumption of various types of fresh and processed fish have been associated with high levels of histamine in the implicated products (**Kawabata *et al.*, 1955; Merson *et al.*, 1974; Sakabe, 1973**). Consequently, histamine is a normal constituent of fermented foods (**Voigt *et al.*, 1974**). The characteristics of the product transformation including a ripening process and bacterial decarboxylation of amino acids (**Veciana-Nogues *et al.*, 1989**). However, during ripening a lower bacterial level is normally detected (**Rodriguez-Jerez *et al.*, 1993).**

Thus high histamine concentration in salted fish could be due to the poor quality of raw material, inadequate handling or other changes during storage (**Rodriguez-Jerez *et al.*, 1993).** Food poisoning due to high histamine in salted fish was not considered until 1982 when **Murry *et al.*,** described a case caused by consumption of semipreserved anchovies. In that outbreak histamine in fish muscle was up to 306 mg/10 g. the action of histidine decraboxylase on histidine (**Arnold and Brown, 1978; Niven *et al.*, 1981; Leitao *et al.*, 1983**) causes high levels of histamine in fish products.

Salt apparently plays an important role in inhibiting the production of histamine as histidine is decarboxylated by members of Enterobacteriaceae which are non-halophilic (**Gibsons and Roberts, 1986; and Rodriguez-Jerez *et al.*, 1994**)

In New Zealand, hot-smoked Kahawai is the product most commonly implicated (**Mitchell, 1993**) in scombroid poisoning. Hot-