



Global Scientific JOURNALS

GSJ: Volume 8, Issue 8, August 2020, Online: ISSN 2320-9186
www.globalscientificjournal.com



Utilization of natural microbial sources to improve quality of feseekh produced under controlled conditions

Graduation project provided by

**Hadeel Fareed Al Saied Salem
Aml Ezat Abd Al halem Abd Allah
Alaa Kamal Abd el Rahman Nafaa**

Dean:

Prof.Dr Ashraf yousef el dakar

2019/2020

Vice dean:

Dr.mahmoud ibrahem

level four

Under supervision:

Dr. Hesham Fawzy Amin

**Assistant Professor, Department of Fish Processing
Technology, Faculty of Fish Resources, University of Suez**

Prof. Ashraf Yousef El-Dakar

Dean of Faculty of Fisheries and Marine Fisheries

Nadia Saber Ahmed .Prof

Professor in National Institute Oceanography And Fisheries

ABSTRACT	4
INTRODUCTION	5
Materials and methods.....	5
Materials.....	5
Methods.....	5
1. Technological process	5
2. Analytical methods.....	7
Sensory methods.....	7
Results and discussion.....	7
1. Sensory evaluation.....	7
texture.....	7
odour.....	8
colour.....	9
Test.....	9
- Conclusion.....	9
- APPENDICES.....	10
- References.....	12



Abstract:

Feseekh is a traditional salted fermented whole fish product of high nutrition, unique flavor that is popular in Egypt. The aim of this study is using Fresh tobarea fish (*Liza ramada*) for rapid and controlled production of feseekh by natural microbial sources. Sensory evaluation shows that the product was high-quality products, served quality attributes, and has a delicate smell of fessikh, free from any objectionable odours, and the fish body has a good color (pink, homogeneous), in addition to the good taste (slightly salted, free from any unacceptable taste) good texture, firm and not chewy.

Introduction:

Fermentation is a natural process that was used for human food supply worldwide. Some of these items include Vietnamese nuoc-mam and Cambodia, Thailand's nam-pla, Japanese sushi and Philippine patis, but Egyptian and Sudanese feseekh is listed as a Mediterranean product, however feseekh from Egypt and Sudan is mentioned as a Mediterranean product.

Salt can be used for preserving fresh fish, The quantities of common 73 salt (sodium chloride) in fish can reduce bacterial action, stopping the action of enzymes in fish. Salting amounts to a process of salt penetration into the fish flesh when fish is placed in concentrated solution of salted water.

Adding lactic acid bacteria (yogurat) during fish salting was found not only caused shortening the curing time, but also enhanced the flavor, prevented the amine production, improved product quality and safety.

Fathermore adding (yeast) *Saccharomyces* that are used for leavening bread and making ales, beer, wine, alcohol, and other products in many food industry. It has also been used to fermented gutted fish to produced feseekh, such as autolyzed yeast and it found that it was found that it accelerates the fermentation process twice faster and in less time than other methods and improves texture and smell somewhat of the other two methods.

Materials and methods

Materials:

1- Fish:

Fresh farmed Tobara fish (*Liza ramada*) with an average of 27.5 cm in length and 275 g in weight were purchased from Suez local fish market, Suez, Egypt.

2- Other materials:

Refined coarse salt was brought from El-Nasr Salines Company, dried yeast, commercial yogurt, sugar, hot chili, paprika and polyethylene bags were obtained from Suez commercial market, Egypt.

Methods:

1. Technological process:

Fresh Tobara fish were washed then they distributed to three groups each one included six washed whole fish. First group left for 30 min to drain. Second and third groups were gutted, washed, left for 30 min to drain and then inoculated with yogurt and sucrose or with yeast and sucrose. Each group was put in transparent plastic bag and closed tightly after released air by hand and then wrapped it with cellophane.

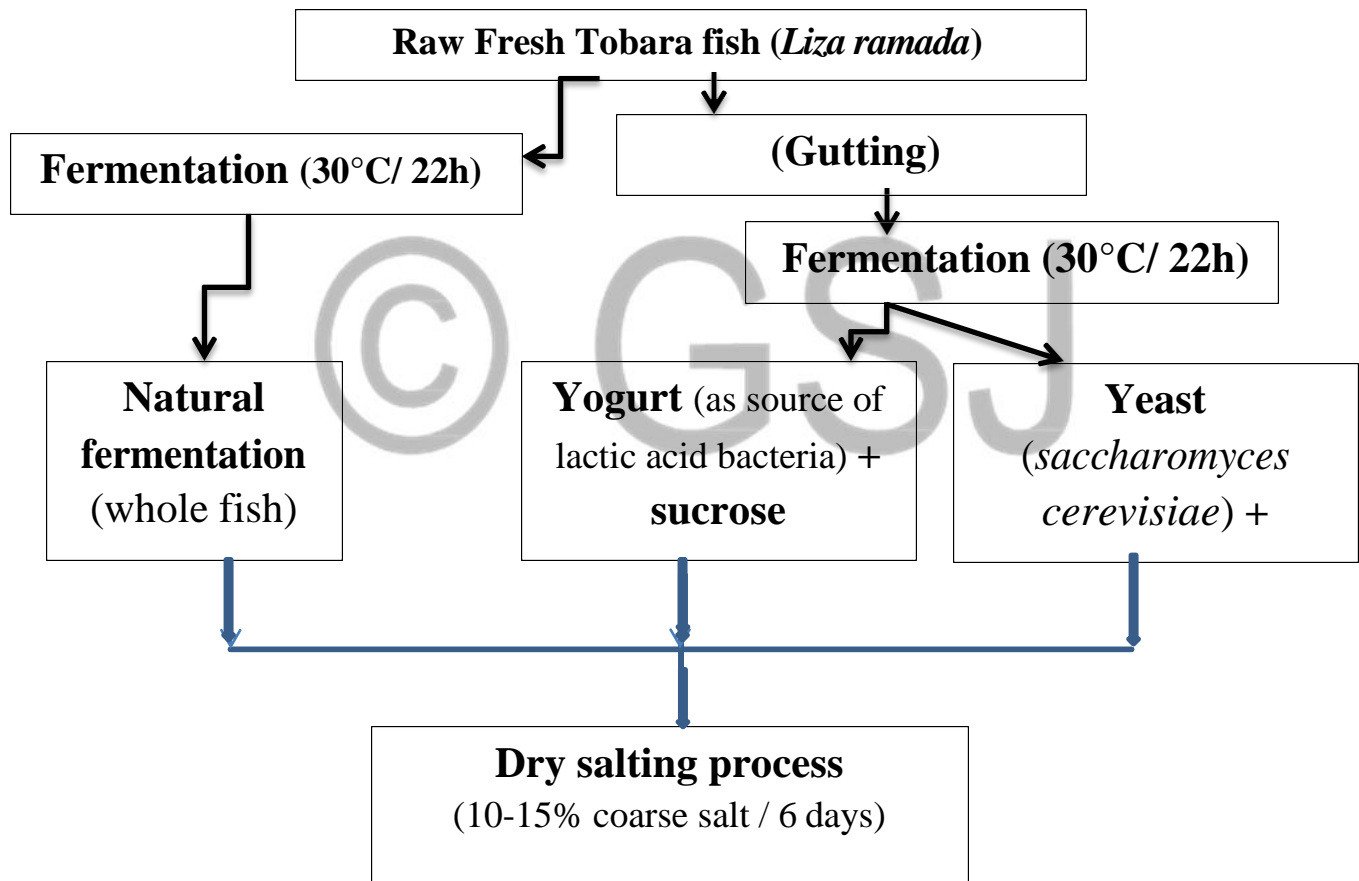
Fermentation was occurred by putting bags in incubator at 30°C for 22hr. After complete fermentation each group was opened separately and then dry salting was started using 10% coarse salt, 0.5% hot chili + 0.5% paprika. Each group after salting was put again in new transparent plastic bag and closed tightly after released air by hand and then wrapped it with cellophane. At the end of day sixth each group was opened to evaluate the products.

The outline technological process pictures for feseekh production:-

1- whole fresh Tobar fish were washed.

- 2- Drainage of washed fish for 30 min.
- 3- Three groups:
 - a) First group (whole fish)
 - b) Second group (gutted fish inoculated with yogurt and sucrose)
 - c) Third group (gutted fish inoculated with yeast and sucrose)
- 4- Put in transparent plastic bag and closed tightly after released air by hand and then wrapped it with cellophane.
- 5- Fermentation was occurred in incubator on 30°C for 22hours.
- 6- Dry salting with 10% coarse salt+ hot chili+ paprika for 6 days in plastic bags.

Flow diagram for Feseekh production:



2. Analytical methods:

Sensory methods:

The endpoint of salted fermented fish processing was identified according to the following apparent signs; high flexibility body muscles when it pressed by fingers, good swelling appearance of the abdominal cavity and there were not any objectionable odours.

Ten trained panelists were used to evaluate appearance, odor, flavor, color, texture, taste and overall acceptability of salted fermented Tobar (*Liza ramada*) products using a 9-point scale, whereas a rating of 1 means extremely-dislike, and 9 for extremely-like .

Results and discussion:-

1. Sensory evaluation:

The apparent signs for the good end of natural, yeast and yogurt salted fermented process were appeared at the same time after 22 hours in incubator. The sensory properties of Tobar (*liza ramada*) feseekh products, were reported in the table (1). The results indicated that all Tobar (*liza ramada*) feseekh products having appetizing feseekh odour, free of any objectionable odours, homogenous pink flesh colour, free of any objectionable taste, slightly salted, soft texture easy to chewy, shiny appearance, the total acceptability of these products by panelists were ranged from extremely good to very good. Yeast salted fermented product was slightly better than natural and yogurt product.

1.1. Texture:

2. After the fermentation process for a 22 hours in Incubator :

- a) In gutted fish inoculated with yogurt and sucrose, it was found that the texture of the fish is coherent and soft, and the signs of fermentation appear on it.
- b) In gutted fish inoculated with yeast and sucrose (fessekh with yeast), the texture was so Soft, smooth and It is noted that effervescence.
- c) In whole fermented fish, the texture is become soft and when pressed with the finger, it leaves a trace.

3. After the salting process for 6 days and during the evaluation:

- a) The texture of the feseekh with yogurt was found to be softer. The textures of the fish were described as similar to the texture of butter.
- b) In the feseekh with yeast, Salt did not affect the softness of the product, and it was not chewy.
- c) In natural fessekh, the texture was acceptable, so soft and not chewy.

a. Odour:

The odour of fermented fishery products varies from mild to very pungent.

1- In fermented fish:

- A) In gutted fish inoculated with yogurt and sucrose, a clear smell of lactic acid was found.
- B) In gutted fish inoculated with yeast and sucrose, a clear smells of sacromyses enzemes.
- C) In whole fermented fish, a clear smells of chemical and enzymatic reaction occur in the fish.

2- after salting process:

- a) In fessekh with yogurt, a very like odour was found and the presence of a slight odour of the desired lactic acid.
- b) In the feseekh with yeast, appetizing feseekh odour with a light yeast smell.
- c) in natural fessekh, it was adorable for consumers.

b. Colour:

For whole products such as feseekh, a silvery appearance close to the fresh product is considered high quality.

1- After the fermentation process:

- a) In gutted fish inoculated with yogurt and sucrose it found that the color of the fish's body became light and the part of the abdomen was light pink.
- b) In gutted fish inoculated with yeast and sucrose, the color is light pink.
- c) In whole fermented fish, the color is not change.

2- after the salting process:

- A) in the feseekh with yogurt found that the skin have a light golden color and the abdominal area were light white color ,and the flash have a light pink colour.
- B) In the feseekh with yeast, the colour is yellowish pink.
- C) in natural fessekh, color is yellowish golden.

c. Taste:

It was found that the taste of feseekh with yeast and fessekh with yogurt is very similar to the natural Feseekh and was slightly salty and presence of the taste of light yogurt to give it a sweet taste and any free of objectionable taste.

Conclusion:

From the previous results, it is observed that the three type of feseekh product are desirable for human consumption according to test panel, and adding the natural microbial sources such as (yeast and yogurt), improved sensory properties of salted fish, And make these products of economic value.

APPENDICES

Test panel(1)

Sample1 (traditional)						Sequen- ce
Overall accepta- pility (50)	Textu-re (10)	Taste (10)	Odour (10)	Colour (10)	Appearan- ce (10)	
44	9	9	8	9	9	1
43	8	9	8	9	9	2
44	9	9	8	9	9	3
43	9	9	8	8	9	4
44	9	9	8	9	9	5
43	9	9	7	9	9	6
42	9	7	8	9	9	7
43	9	8	8	9	9	8
43	9	8	8	9	9	9
44	9	9	8	9	9	10

Panel test (2)

Sample2 (yogurt)						Sequen- ce
Overall accepta- pility (50)	Textu-re (10)	Taste (10)	Odour (10)	Colour (10)	Appearan- ce (10)	
44	9	8	9	9	9	1
41	9	8	8	8	8	2
41	9	8	8	8	8	3
43	9	7	9	9	9	4
45	9	9	9	9	9	5
42	9	8	9	8	8	6
45	9	9	9	9	9	7
41	9	9	8	8	7	8
45	9	9	9	9	9	9
44	9	9	8	9	9	10

Panel test(3)

Sample2 (yeast)						Sequen- ce
Overall accepta- pility (50)	Textu-re (10)	Taste (10)	Odour (10)	Colour (10)	Appearan- ce (10)	
42	9	9	8	8	8	1
41	9	8	8	8	8	2
45	9	9	9	9	9	3
40	9	9	7	7	8	4
45	9	9	9	9	9	5
40	9	7	9	7	8	6
45	9	9	9	9	9	7
38	8	8	8	7	7	8
44	9	9	9	8	9	9
45	9	9	9	9	9	10

- 9 Extremely-like
- 8 very like
- 7 moderate like
- 6 slightly like
- 5 nor like nor dislike
- 4 silghtly dislike
- 3 moderate dislike
- 2 very dislike
- 1 Extremely-dislike

Table (1): Sensory properties of Tobar (*Liza ramada*) feseekh products:

Quality attributes	Natural Tobar feseekh	Yeast Tobar feseekh	Yogurt Tobar feseekh
Odour	8	8.1	8.6
Colour	7.9	8.1	8.6
Taste	8.6	8.5	8.4
Texture	8.9	9	9
Appearance	8.3	8.5	8.6
Overall acceptability	8.5	8.5	8.6

References:-

Chemical and Microbial Properties of Egyptian Traditional Salted Warmed Fermented Tobar Fish product-Fesikh . Hesham F. Amin Ahmed(February 2019).

by Mustafa a. A. Gassem(13 October 2016). Microbiological and Chemical Quality of a Traditional Salted-Fermented Fish (Hout-Kasef) Product of Jazan Region, Saudi Arabia

Amano, K. 1962. The influence of fermentation on the nutritive value of fish with special reference to fermented fish products of Southeast Asia. In: Fish in Nutrition. Heen, E. and Kreuzer, R. (Ed.)Fishing News (Books) Ltd, London. pp. 180-200.

AOAC.1990. Official Methods of Analysis, 15th edition. Association of Official Analytical Chemists., Washington DC.

Campbell-Platt, G. 1987. Fermented Foods of the World, A Dictionary and Guide.Butterworths, London. CorbiereMorot-Bizot, S., Leroy, S., and Talon, R. 2006.

Dai, Z., Li, Y., Wu, J., and Zhao, Q. 2013. Diversity of lactic acid bacteria during fermentation of a traditional Chinese fish product, Chouguiyu (stinky mandarin fish). *J Food Sci.* 78(11):M1778-83.

Changes in some chemical characteristics and lipid composition of salted fermented Bouri fish muscle (*Mugilcephalus*). *J. Food Chemistry* 31(1): 41-50

Hasan Basri Ormancil * and Fatma Arik Colakoglu, Nutritional and sensory properties of salted fish product, lakerda, *FOOD SCIENCE & TECHNOLOGY | RESEARCH ARTICLE*

Drying and Salting of Fish Parvathy U. Fish Processing Division ICAR-Central Institute of Fisheries Technology, Cochin

Mustafa A. Gassem 2019 , Microbiological and chemical quality of a traditional salted-fermented fish (Hout-Kasef) product of Jazan Region, Saudi Arabia, *Saudi Journal of Biological Sciences*.

Hafez, N.E1 , Awad, A.M1 , Ibrahim, S.M2 , Mohamed, H.R2* and El-Lahamy, A.A2, Changes in Sensory Characteristics of Salted Mullet Fish Products during Storage at Room Temperature, *Research Journal of Food and Nutrition* Volume 3, Issue 2, 2019, PP 6-10 ISSN 2637-5583.

Edris, A.A* , Reham A. Amin* , Marionette Z. Naseif**, Ebtsam M. AbdelFatah**, Evaluation of Retiled Salted Fish according to Egyptian Standard, Food Control Dept., Fac.Vet.Med., Benha University. **Food Hygiene Dept., Animal Health research Institute, Dokki.

(*Squalius cephalus* Linnaeus, 1758) Arzu BINICI1 , Gülderen Kurt KAYA2 *,Effect of brine and dry salting methods on the physicochemical and microbial quality of chub

Egbal Osman Ahmed^{1*} and Mohamed Eltaher Ali^{2 1}, Effect of the Seasons and Salt Concentrations on Microbial Load of WetSalted Fermented Product (Fassiekh) ,Marine Resources Department, Faculty of Natural Resources and Environmental Sciences Omar AL-Moukhtar University, El-Beida, Libya ² Fish Research Center, Khartoum, Sudan.

Eltom, A. (1989). Microbiology and biochemistry of fessiekh fermentation. M. SC. University of Khartoum, Sudan

Somboon Tanasupawat¹ and Wonnop Visessanguan² ¹Department of Biochemistry and Microbiology, Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok, Thailand ²Food Biotechnology Research Unit, National Center for Genetic Engineering and Biotechnology (BIOTEC), Klong Luang, Pathum Thani, Thailand, Fish Fermentation.

CHRISTINE PALUDAN-M~LLER Danish Institute for Fisheries Research Department of Seafood Research Danish Technical University Building 221 DK-2800 Lyngby, Denmark, THE MICROBIOLOGY OF LOW-SALT FERMENTED FISH PRODUCTS.

© GSJ