



The Impact of Drying and Salting on the Fish Resilience and Quality

Rani^{1*}, Nurhidayati Sholihah², Fadzilatul Mutmainah³, Sopia⁴, Rahmi⁵, Nur Aisyah⁶,
Eni Marta⁷ 

^{1,2,3,4,5,6,7} Jurusan Guru Sekolah Dasar, STKIP Rokania, Pasir Pangaraian, Indonesia

*Corresponding author: raniazza1730@gmail.com

Abstrak

Pengeringan ikan merupakan salah satu cara pengawetan ikan yang dilakukan dengan cara mengurangi kadar air ikan sehingga aktifitas mikroorganisme dapat dikurangkan. Pengawetan dengan cara pengeringan ini ditujukan untuk memperpanjang daya simpan ikan. Cara pengolahan dengan cara pengeringan tersebut telah lama dilakukan untuk beraneka ragam spesies ikan. Penelitian ini bertujuan untuk menganalisis pengaruh pengeringan terhadap ikan yang diberi garam dan tanpa garam untuk menguji ketahanan dan kualitas pada ikan. Pembuatan ikan asin merupakan pengawetan yang paling sederhana dengan biaya murah. Karakteristik ikan yang memiliki PH netral, tekstur lunak, dan kandungan gizi yang tinggi menjadikan ikan medium yang baik bagi pertumbuhan bakteri. Untuk mengatasi adanya kerusakan maka kebanyakan masyarakat Indonesia melakukan pengolahan ikan, diantaranya diolah menjadi ikan asin. Ikan asin merupakan salah satu bentuk produk olahan ikan tradisional dengan teknologi pengeringan dan pengaraman. Berdasarkan hasil penelitian maka didapatkan kesimpulan bahwa, Ikan asin yang dikeringkan melebihi 12 jam pemanasan pada matahari menghasilkan produk yang dapat diterima oleh konsumen, sedangkan pengeringan dibawah 8 jam menghasilkan produk yang kurang diterima oleh konsumen. Perlu adanya uji lanjut tentang masa simpan serta perlu penggunaan pengemasan yang higienis. Berdasarkan analisis, konsentrasi garam dan lama pengaraman tidak memberikan pengaruh yang nyata terhadap tekstur, aroma.

Kata kunci: Ikan Asin, Ikan Tradisional, Pengeringan

Abstract

Drying fish is one way of preserving fish by reducing the water content of fish so that the activity of microorganisms can be reduced. Preservation by drying is intended to extend the shelf life of fish. Many fish species have used the drying method for a long time. This study aimed to analyze the effect of drying on salted and unsalted fish to test the resistance and quality of fish. Making salted fish is the simplest preservation with low cost. The characteristics of fish that have a neutral pH, soft texture, and high nutritional content make fish a good medium for bacterial growth. Most Indonesian people manage fish to overcome the damage, including those processed into salted fish. Salted fish is one form of traditional fish processed products with drying and salting technology. Based on the study's results, it was concluded that salted fish that was dried for more than 12 hours of heating in the sun produced products that were acceptable to consumers, while drying under 8 hours produced products that consumers did not accept. There is a need for further testing on the shelf life and the need for the use of hygienic packaging. Based on the analysis, the concentration of salt and time of salting did not significantly affect the texture and aroma.

Keywords: Fish, Traditional Fish, Drying

1. INTRODUCTION

Fish drying is one of the ways of fish preservation, which is carried out by reducing the water content of fish so that the activity of microorganisms can be reduced (Aniesrani Delfiya et al., 2022; Bau et al., 2021; Rizal & Muhammad, 2018). Pickling by this way of drying is aimed at extending the shelf life of fish. The management by drying has long been carried out for various fish species (de Melo Ramos et al., 2021; Oktarina, 2016; Sumarno et al., 2020). Fishermen have long carried out the drying of such anchovies. The drying of fish with sunlight is carried out by drying the fish for \pm three days if the weather is sunny and

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flipping the fish 4-5 times for even drying (Bau et al., 2021; Di Giorgio et al., 2022; Hatta et al., 2019). The problem or drawback is that the hygiene of dried fish is very lacking since drying is carried out in the open, it is easily infested with dust, and flies and microorganisms can develop (Cui et al., 2021; Lowerre-Barbieri et al., 2017). This can certainly affect the quality of the dried fish. The quality of dried fish in the sun is very easily contaminated by dust, flies, and microorganisms (Pomegranate et al., 2022; Rizal & Muhammad, 2018). This can trigger mold growth in dried fish. Dried fish that is dried in the sun openly has a less good quality because it is more easily contaminated by microbial contaminants, especially those that can produce mycotoxins. This can harm consumers' health (Cavender et al., 2015; Cui et al., 2021).

Some fishermen traditionally dry fish in Rokan Hulu, especially around the roasting sand. Generally, the dried fish are snakehead fish and anchovies. The local name of the anchovy is Boloa. The need for fish consumption is increasing yearly along with the increase in population. The amount of fish consumption in Indonesia in 2010 was around 30.48 kg/cap/yr and increased by 4.81 % in 2011 to 31.64 kg/cap/yr, meaning that Indonesia's fish consumption needs have met the FAO standard of 30 kg/cap/yr (KKP, 2011). The potential of the capture and aquaculture fisheries sector is spread almost in all Indonesian waters, this can be seen from the number of fishery products for the 2010-2011 period, which increased by 6.20%, namely 11.6 million tons in 2010 to 12.3 million tons in 2011 (KKP, 2011), so this is the main factor in increasing fish consumption. One way to increase public consumption of fish species is to diversify the type of food into dried salted fish because salted fish has been widely known and easy to process (Azizah et al., 2022; Kambey et al., 2001). The processing of dried salted fish by the community is still traditional, so the use of concentration and duration of salting differs by the individual (Azizah et al., 2022; Rizal & Muhammad, 2018). The level of acceptance or consumer liking for dried salted fish needs to be considered because consumer acceptance is one factor that affects the consumption of a food ingredient. Therefore, it is necessary to research testing the level of liking (hedonic test) in dried salted fish that are processed with different concentrations and salting duration. This study aimed to analyze the effect of drying on salted and unsalted fish to test the resistance and quality in fish and to determine salt resistance and proper feeding duration in salted fish management.

2. METHODS

The main ingredients used were catfish, as many as 54 heads with a weight of ± 250 gr/head, and table salt with a NaCl content of 95%. Fresh milkfish was weeded and washed and then split. Before salting, the fish was weighed, then dried in the sun after being stored after salting. Dried salted catfish were tested for hedonic organoleptic (SNI 01-2346-2006) to determine the selected product. The equipment used to manage dried salted catfish was a container/bucket, a knife, a fish drying device, and a scale (vanezia SF-400A). For organoleptic testing, use score sheets and stationery. The flow of the research carried out is presented in Figure 1.

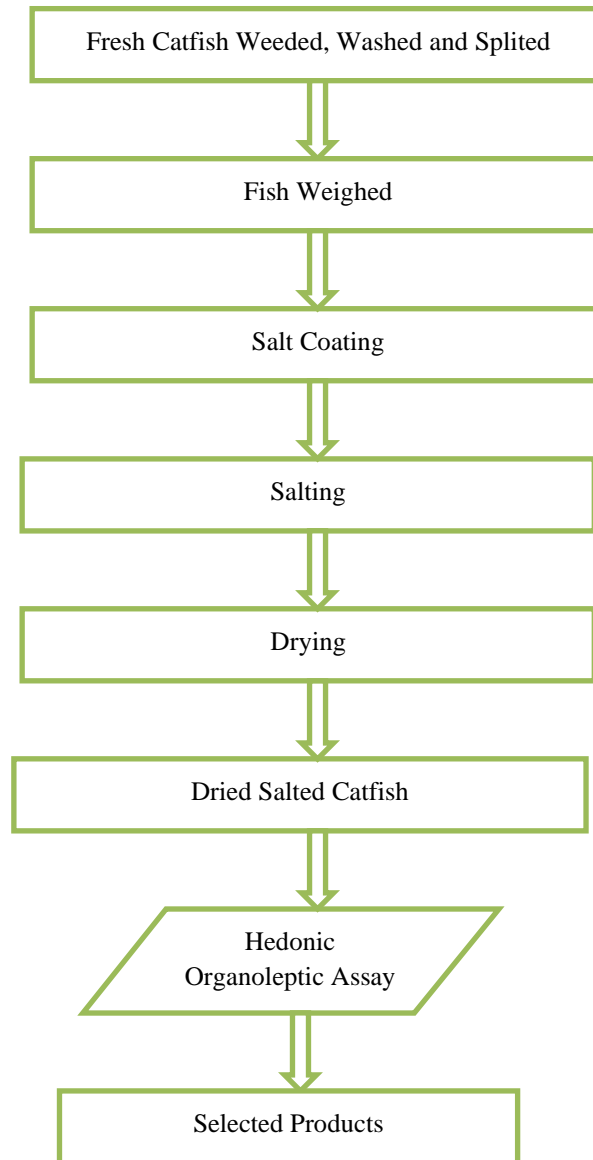


Figure 1 Flow of Research Activities

3. RESULTS AND DISCUSSION

Result

Based on the results of the study, several findings were found. The first taste was the sensation received by our taste buds in the oral cavity. The taste was caused by water-soluble compounds that interact with receptors on the tongue and the sense of taste (trigeminal) in the oral cavity. Currently, the human tongue recognizes 5 primary flavors: sweet, bitter, sour, salty, and umami, the latest. The taste was the main factor in determining whether a product is delicious or not based on consumer assessments. Consumer acceptance of the taste of salted fish was influenced by subjectivity per individual, and consumers prefer low salt content. The author's favorability for salted fish tends to decrease with the increase in salting time because the salt that permeates the fish meat was getting more and more, causing a saltier taste. High salt concentration causes the product's taste to become salty and sometimes not liked by consumers. The salt used largely determines the saltiness and shelf life of the salted fish produced. It was also added that the ideal amount of salt for salting medium-sized

fish such as catfish, tilapia, astringent fish, sea fish, snakehead fish, and other types of fish ranges from 15 % - 25% of the weight of the fish after drying.

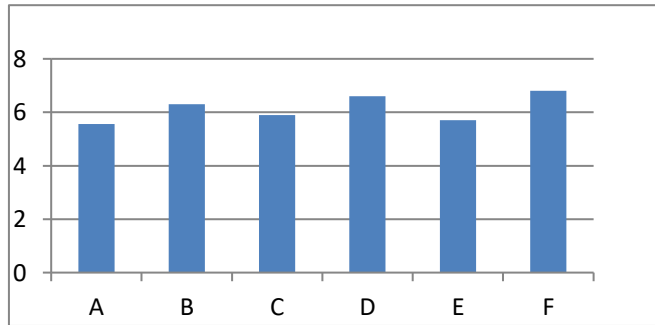


Figure 2. Average value of hedonic test taste

The analysis results in [Figure 2](#) for the hedonic taste test in salted catfish showed a noticeable difference between the salt concentration and the time of saltiness on the taste of dried salted catfish. Duncan's advanced test results stated that the F treatment provided a noticeable difference in all treatments. The average value of the hedonic test for the taste of dried catfish showed that the lowest author's favorability value was found in the A (somewhat like) treatment with the criteria of good quality, specific type, slightly different taste, and the highest value based on the author's liking for the F treatment (likes) with the criteria of excellent quality, type-specific, without additional taste. The second was texture, closely related to the moisture content of foodstuffs. In dry salted fish, the texture is influenced by water content, and the low water content makes the consistency of salted fish better ([de Melo Ramos et al., 2021](#)).

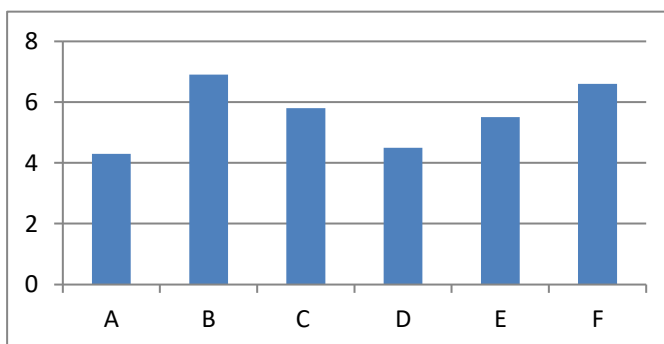


Figure 3. Hedonic Test Texture Average Value

The analysis results in Figure 3 show that the effect of salting on salted fish does not differ markedly from the texture of dried catfish. The average score of the author's acceptance on the hedonic test showed that the author's assessment was almost the same, and the range of values was not too far away for each treatment. However, the author's review tends to increase with the increase in salt concentration and salting time so that the texture of the fish becomes dense and compact and affects the author's level of acceptance of the texture of dried catfish. The average level of the author's liking for the texture of salted catfish tends to increase with increasing salt concentration and soaking time. The treatment causes the salted fish to look drier due to the low moisture content. The use of hygroscopic salt in salted fish causes the texture of the fish to become compact and dense. The average value of the hedonic test in Figure 2 for the texture of dried salted catfish shows the author's acceptance value ranges from 6.00-6.50. the lowest acceptance value was found in treatment A with the quality criteria too hard and too fragile, and the highest value in B with the quality criteria in dried catfish. The third was the aroma. The aroma of dried salted fish is often affected by the hydrolysis of fats in the drying process. If there is the hydrolysis of fat, a product will have a stinky scent. The presence of water will accelerate the hydrolysis of fats.

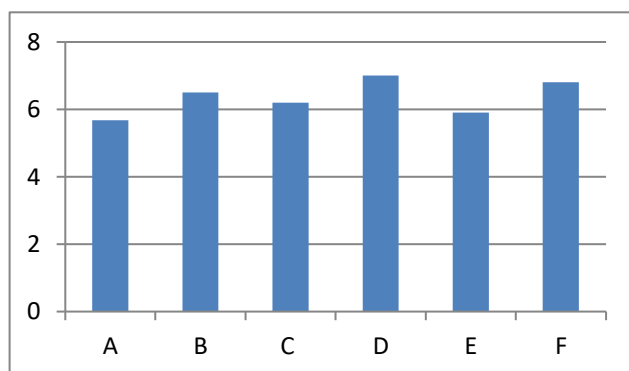


Figure 4. Average Value of Hedonic Test Aroma

Hasil analisis in Figure 4 shows that salt concentration and salting duration did not give a noticeable difference in the aroma of dried salted catfish. Based on the results of hedonic testing on the smell of dried salted catfish, it can be seen that treatment A has the highest acceptance value; with the increase in salt concentration and the length of salting, the author's judgment increased. The cause was suspected to be due to the oxidation process that has not continued, so the process hampers rancidity. In addition, this salted catfish has not undergone storage, so the process of a fat overhaul by enzymes has not occurred.

Discussion

The treatment of salt concentration and soaking time did not make a noticeable difference to the author's degree of liking for the smell of salted catfish because it was likely that salt did not have much influence on the aroma of salted fish. Even if the fat can cause

rancidity, if the process has not continued, it will produce an aroma that consumers like. Freshly produced or processed salty fish tends to be preferred by consumers because there are no physical deviations such as odors (Cui et al., 2021; Richa et al., 2022). Change or decomposition of fat can affect the smell and taste of a food ingredient, especially in times of deviation, so fat damage can reduce nutritional value and cause deviations in smell and taste (Azizah et al., 2022; Pomegranate et al., 2022). The most preferred hedonic quality characteristics of salted catfish chips are chips with traditional drying methods with texture, taste, and aroma. The characteristics of the hedonic quality of selected catfish skin chips are chips with traditional drying methods based on the appearance of whole, neat, clean, uneven thickness, bright whitish cream color; the smell of chips, which is less strong fish flavor; the taste after frying is that the taste of the fish is not strong enough and the texture is quite dry and has a crispness with a value of 1110.

Based on the study's results, it was concluded that salted fish that was dried beyond 12 hours of heating in the sun produced products that were acceptable to consumers while drying under 8 hours produced products that consumers less accept. Based on the Indonesian National Standard (SNI) for water content, foreign catfish products dried with the sun for above 8 hours have good quality. There needs to be further testing of the shelf life and the need for hygienic packaging. Based on the analysis, the salt concentration and the watering duration do not affect the texture and aroma. But it has a noticeable effect on the taste of dried salted catfish. From the results of this study, it is suggested that further research is needed to determine the effect of drying on salted and unsalted fish to achieve resistance and quality in fish. It is also necessary to study drying harrowers using different watering methods to manage dried salted catfish to the quality characteristics of the salted catfish produced.

4. CONCLUSION

The drying process of fish with variations in time and solar temperature and the type of fuel used greatly affects the quality of dried salted fish. Drying with an open system is of better quality because it is more hygienic. The ideal drying time is 12 hours with an average temperature of 70° C, and the type of fuel used is the sun because the energy/heat produced by the sun is better, and the fish produced dry faster.

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