International Journal of Materials Chemistry and Physics
Vol. 2, No. 1, 2016, pp. 40-44
http://www.aiscience.org/journal/ijmcp

Quality Deteoration Gourami Fish (*Osphronemus Gouramy*) During Storage

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Abstract

Gourami (*Osphronemus gouramy*) is a native fish the waters of Indonesia, including hearts Osphronemidae family. Many cultivated carp because Posted Farmers Market Countries The High demand, easy maintenance, the price is relatively stable As well as a high nutrient content. The carp is a fish has a rather slow growth when compared with other omnivorous fish. The growth pattern usually affects large proportion. There are several factors affecting the quality of fish setback That includes internal factors relating That with nature of fish and external factors related to the environment and human treatment. The fish will die soon undergo rigor mortis process is longer in comparison with the fish left to die. The aimed study for a review to determined the characteristics (morphology size) and proportion of carp, as well as determining the level of freshness gourami That soon turned off on cold temperature treatment is reviewed from organoleptic test. Largest on carp yield practical hearts is a meat by 44%, followed Posted head and bones 39%, 9% of skin and scales, as well as the innards of 8%. Quality setback occurred carp all parameters such as eyes, gills, slime surface, meat, smell and texture. Signs of Quality setback for all these parameters by average Start visible from storage for 3 days time up To the storage time for 7 days.

Keywords

Gourami Fish, Qualty, Storage

Received: September 17, 2015 / Accepted: October 15, 2015 / Published online: January 11, 2016

1. Introduction

Gourami (*Osphronemus gouramy*) is a native fish the waters of Indonesia, including in the family Osphronemidae. Carp cultivated by farmers due to the high market demand, easy maintenance, the price is relatively stable, high nutrient content and taste good (Jangkaru, 1998, in Nurjanah et al., 2011). Fish growth is influenced by several factors such as gender, age, heredity, and the availability of food (Effendie 1997 and Kayama, in Nurjanah et al., 2011). Large yield of fish affected by the pattern of growth of the fish. Growth in fish is influenced by several factors, including fish species, sex, age of fish, fishing ground, the season and the type of food available (Hadiwiyoto 1993, in Nurjanah et al., 2011).

Carp is a fish that has a somewhat slower growth, but the price is relatively increased at any time. Regular feeding with high quality and quantity that can boost the growth of the fish's body more quickly. Parent-parent carp healthy and secure food can breed twice a year for 5 consecutive years (www.ristek.go.id). Gourami fish known as the slow movement, so often unable to compete with other fish species in the animal food fight. So it is not surprising that the growth is not as fast as other omnivorous fish (Diskan Tabanan, 2012).

Fresh fish has the disadvantage that is susceptible to damage or deterioration of quality (highly perishable). Determination of fish setback subjectively (organoleptic) can be performed using a score sheet that has been set by the National Standardization Agency with SNI 01-2346-2006 (BSN, 2006, in Nurjanah *et al*., 2011). Organoleptic observations include several parameters, namely the state of the eyes, gills, body surface mucus, meat, smell and texture. The process of

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deterioration in the quality of the fish will continue if not inhibited. Many factors affect the quality deterioration of fish that includes internal factors that have more to do with the nature of the fish itself, and external factors related to the environment and human treatment. The fish will die soon undergo rigor mortis process is longer than the fish left to die. Low temperature treatment can also be extending the phase of rigor mortis. At low temperature conditions, the growth of spoilage bacteria and biochemical processes that take place in the body of the fish that lead to quality deterioration becomes slower. The aimed study for a review to determine the characteristics (morphology size) and yield of carp, as well as determining the level of freshness gourami That soon turned off on cold temperature treatment is reviewed from organoleptic test.

2. Material and Method

2.1. Material and Tools

The tools used in this lab is based on ISO 01-2729.1-2006 organoleptic scoresheet, while other woods tool in the form of a container for fish, scales, instruments surgical supplies, ruler (ruler), rags, plastic and stationery supplies. The main materials used in the study is gourami (*Osphoronemeus gouramy*).

2.2. Sampling Techniques

Carp used in this lab was purchased from the pool in Sempur in the form of fresh fish. The size of the fish used ranged from 21-24 cm. The fish is collected in a plastic bucket container then taken to the laboratory for observation and organoleptic testing by using a score sheet.

2.3. Research Method

The first step is done in the lab is carp divided according sample code 1-5. Carp on sample code 1, 2 total weight was measured and weighed beforehand. After the carp in the 1.2 sample code weeded where entrails, gills and viscera are separated. Carp that have been weeded out and all APISI`s (entrails, gills and viscera) weighed. Once weighed, carp put into a plastic bag according to the code sample and then cooled. The next step is the observation and testing of carp in sensory freshness by using a score sheet for assessment standards

3. Result and Discussion

3.1. Morfology Gourami Fish

Carp used in this lab is obtained from aquaculture pond, Bogor. The sample used for then measurement of length, width, height, and weight in a state of total fresh and intact. Carp has a shiny black leather top and silvery white on the bottom. The appearance of carp can be seen in Figure 1.

Figure 1. Gourami fish.

Based on the measurement results, obtained data on the size and weight of carp. Parameters observed that the total length, standard length, height and weight of the total. Morphometric data carp can be seen in Table 1

Table 1. Size and weight gouramy fish.

Code sample	Total length(cm)	Raw length(cm)	Total hight(cm)	Weight(g)
1	18	15	7.7	119
2	20	16	8.7	175
3	21	17	9.4	191
Average	59.0	16.4	8.6	161.7

Table 1 showed that carp are used in this lab has a total length of 59 cm, standard length of 16.4 cm, height 8.6 cm, and weighs 161.7 grams. According Nurjanah et al. (2011) cultivation of carp fed pellets and natural food taro leaves vary in size at harvest time certain. The size of carp harvested at the age of 2.5 years, 1.5 years and 8 months had an average total weight and total length of the row, ie 995.45 g ± 1.85 g; 36-38 cm, 697.65 g ± 1.24 g; 32-34 cm, 345.55 g ± 1.42 g; 27-29 cm.

The size and weight of carp affected by growth, sex, age, diet and supportive environment for growth. Growth is change in size, good weight, length or volume in the rate of change of time. Growth is influenced by several factors: factors inside and outside. Factor in a factor that is difficult to control, for example, genetic. The external factor is a factor that can be controlled, such as food and temperature (Effendi, 1997).

3.2. Proportion

Proportion is the presentation of the weight of the body that can be used to generate economic value of a raw material. The higher the value of Proportion of the raw material, the higher the economic value. Calculations yield is obtained by

comparing the weight of each body part by weight of catfish intact. The percentage yield of meat, skin and scales, head and bones and offal fresh carp can be seen in Figure 2.

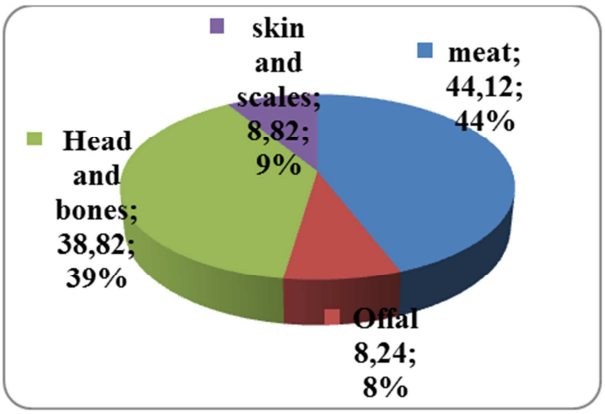

Figure 2. Presentation proportion gourami fish.

Proportion on the carp in this lab is the meat by 44%, followed by 39% of the head and bones, skin and scales 9%, 8% and offal. According Nurjanah et al. (2011) yield the most widely owned carp namely meat and bone. Proportion of meat in a row for fish aged 7-12 months, 1.5-2 years of age, and the age of 2.5-3 years, ie 45%, 49% and 52%. Proportion of the bones in a row for age 7-12 months, 1.5-2 years of age, and the age of 2.5-3 years, ie 38%, 34% and 30%. It shows an increase in Proportion of meat and bone yield decrease with increasing maintenance time. While proportion for offal range between 6-8%, 1-2% gills, fins and scales 3-5% 4%. Fish yield is influenced by the pattern of growth. Growth in fish is influenced by several factors, including fish species, sex, age of fish, fishing area, seasons, and the types of food available (Hadiwiyoto, 1993 in Nurjanah et al., 2011).

3.3. Organoleptic Gourami Fish

Determination of fish quality deterioration is subjectively (organoleptic) is done using a score sheet that has been set by the National Standardization Agency with SNI 01-2346-2006 (BSN, 2006). Sensory or organoleptic test, the testing conducted to provide an assessment of a product, by relying on the senses (Anne, 2010). Observations organoleptic includes several parameters, namely the condition of the eyes, gills, body surface mucus, meat, smell and texture.

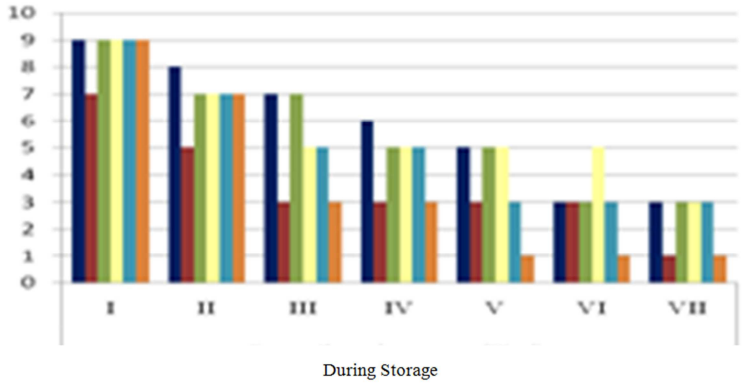

Figure 3. Histogram difference storage time and the average value of organoleptic eyes (blue), gills (red), body surface mucus (green), meat (yellow), smells (blue) and textures (brown).

Based on Figure 3 carp decline of quality in all parameters (eyes, gills, slime surface, meat, smell, and texture) with increasing storage time. Shortly after the fish dies, the fish began to undergo a process of degradation or deterioration, caused by three kinds of activities, namely autolysis, chemical, and bacterial (Elias, 1983, Jaya and Ramadan in 2006). Junianto (2003) in Jaya and Ramadan (2006) states that after the dead fish, various process changes the physical, chemical and organoleptic progresses rapidly which eventually leads to decay, with a sequence of process changes include changes in pre rigor, rigor mortis, activity enzymes, microbial activities and oxidation. In general, rigor mortis event consists of three stages: pre rigor, rigor and post-rigor mortis. Determining the level of freshness of the fish can be done through physical parameters, sensory / organoleptic, chemical, and microbiology.

3.4. Quality Eye Level Setback Gurami

Based on the figure 3, it can be seen that the average value in the storage of 0-1 days is 9. This shows the storage of 0-1 days the fish are still categorized as very fresh, because the organoleptic eyeball (pupil) shiny bright black eyes still prominent and the cornea of the eye membrane is still clear. On the 2nd day almost the same as 0-1 days, the difference between average eyeball fish start. And on the third day of storage signs of deterioration of quality of fish began to be seen that the color of the pupil changed somewhat greyish and somewhat turbid cornea eyeball although still somewhat brighter. At 4-5 days storage markings more visible quality deterioration which started somewhat sunken eyeballs, it is consistent with the statement Hadiwiyato (1993) which states that the decline of fish quality on stage was showing a rather

sunken eyeball and cornea slightly cloudy, In the 7-day storage of the average value suggests that the organoleptic eyes have changed very real is very sunken eyes and the black sink, looks milky white pupil, and the cornea becomes cloudy and slightly yellow. Based on the results of the organoleptic analysis of the eyes of carp, it is known that the longer the storage of the average value of organoleptic decreased. According to Ilyas (1983), one of the consequences of bacterial growth is so immersed eye and the light faded. FAO (1995) explains that the fish in fresh condition show pupils gray white milk crate covered in slime, eyes sunken and cloudy.

3.5. Quality Level Setback Gills Gurami

In the gills, it can be seen that the organoleptic value of carp on the storage of 0-1 days showed an average value 7 in which the gills of carp already showing a dull red color, but not containing mucus. While the 2-day storage nascent small amount of mucus on the gills of fish. Setbacks quality began to look at the storage of 3-7 days in which the color of the gills in fish change color from pink to red-brown, thick mucus, and there seemed to white patches on the gills. According to Taher (2010) organoleptic fish with these signs can not be consumed again. According Berhimpon (1993), freshly caught fish containing microbes naturally. Microbes are concentrated in three main parts: the surface of the skin, gills and entrails. The number of bacteria in fish vary, depending on the medium in which the bacteria live which is between 102-105 / g on the skin, 103-105 / g in the gills and can reach 107 / g on the stomach contents. Based on existing data, it can be said that the change of color on the gills that may occur due to the increase in the number of bacteria.

3.6. The Level of Decline of Quality Meat Gurami

Special observation of the flesh, made an incision in the tail, at the time of the incision, rather tough meat in slices, this shows the fish meat is still fresh. This is in accordance with the opinion of Stansby (1963) in Zakariya et al. (2008) which states that the fresh fish flesh elastic and not easily separated from the bone. Observations show that the first day was very bright cutlet, specific kind, no milking along the spine and abdominal wall intact meat. On day 2-6 of meat organoleptic test score dropped to 5, indicating cutlet slightly less bright, the specific kind, no milking along the spine and abdominal wall intact meat. According to the Indonesian National Standard (SNI) in Widiastuti (2007) stated that the quality of fish that are still suitable for consumption ranges between 5-6. However, these conditions also need to be aware if they have symptoms arise microbiological attack. If already there are signs of better fish are not consumed because it will cause disease.

Score the fish meat on the observation 7th namely 3, which shows the cutlet dull red color clearly along the spine, the soft belly meat. At this stage already begun entering the post-rigor stage, that stage where the stage of rigor mortis has completed the mark with increasing pH and fish meat soft start due to the decomposition of macromolecular compounds into simpler compounds. According to Frazier and Westhoff (1978) in Astawan et al., (1996) states that fish contains non-protein nitrogen (NNP). After the dead fish, the fish will change due to the enzyme that breaks down autolysis NNP, thus increasing the content of nitrogen compounds eg amines and amino acids and glucose for bacterial growth. The compounds of the bacteria producing trimethylamine, ammonia, amines, fatty acids, aldehydes, and sometimes hydrogen and sulfide, markaptan and indole. Such compounds are an indication of the formation of the decay process where the meat is increasingly softened.

3.7. Quality Level Setback Odor Gourami

The presence of microorganisms in fish also lead to changes in odor. The odor arising from an increase in ammonia (NH3) in the degradation of proteins and H2S gas in the degradation of proteins containing sulfur generated by H2S forming bacteria. The presence of these gases will reduce the level of preference for these gases smell bad. Damage to food caused by microorganisms turned out to be the most harm. It can be seen from the appearance of the fish and from the smell that wafted, which include severe shrinkage, volume shrinkage, changes in the composition due to the formation of toxic compounds in food.

The smell of carp on the first day the score is 1, which indicates a very fresh smell, specific types. A score of 5 on days 3-4 showing the smell of ammonia began to smell and slightly sour smell. On day 5-7 score reached 3 which indicates a strong ammonia odor, there would H2S, clear and foul smells sour. This indicates the fish is not fresh start because in addition to the chemical process occurs, there is also the activity of bacteria which produce ammonia. According to FAO (1995) the condition of the fish is not fresh on the mark with the onset of odors such as acetic acid and gradually turned into a foul smell offensive.

3.8. Texture Quality Organolpetic Gurami

The first observation of the texture of the fish showed a dense texture, elastic when pressed with a finger and tore the flesh from the bones hard behind with a score of 9. At day 5-7 score to 1 which showed that a very soft texture, fingerprints do not disappear when pressed and easy tore the flesh of the spine. This is because there has been a process of rigor mortis in which at this stage occurs autolysis, which occurs due to the action of the enzyme katepsin decipher complex compounds

into compounds which are simpler and followed with decreasing pH.

Based on the research results Zakaria et al., (2008) stated that the texture of carp fresh dense, elastic when pressed premises finger, difficult to tear meat from the spine and the fish in a state of weakness, while fish that have been stored in a temperature chilling for 180 hours of fishing begins to soften, less elastic when pressed with a finger and easily tear the flesh of the spine.

The longer the storage time of carp, the fish quality will decrease even if the fish is kept at a temperature of chilling. This happens because of the chilling temperature (2-4°C) was not able to inhibit the growth of bacteria. According to Ilyas (1983) The development of bacteria in fish is strongly influenced by temperature. The lower the temperature used, the more bacteria growth is inhibited. Bacteria grow at large, namely 0-45oC. At a temperature of 2-10°C less rapid bacterial growth and quality of fish declines slow or fast enough, so the fish durable power of short (2-5 days).

According Junianto (2003) organoleptic changes in fish may be due to several factors such as microbial activity and chemical reactions in the fish meat. Microorganisms can lead to degradation of specific compounds by enzymes produced by microorganisms inter alia proteolytic enzymes that degrade proteins and lipase enzymes that degrade fats.

4. Conclusion

From the results of research conducted carp can be concluded that the decline of quality in all parameters such as eyes, gills, slime surface, meat, smells and textures along with increasing storage time. Signs of deterioration of quality for all these parameters on average starting to look out of the storage time for 3 days until the storage time for 7 days. As for the biggest carp endemen there is meat in the amount of 44% followed by the head and spine by 39%, skin and scales by 9%, as well as the innards of 8%.

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