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Comparison of The Organoleptic Aspects and The Number of Germs Between Healthy Broiler Chicken Meat and Injected Broiler Chicken Meat Frida Hendrarinata¹, Denok Indraswati², Djoko Windu P. Irawan³, Lilis Prihastini⁴ 1,2,3&4Health Polytechnic of Surabaya, Indonesia E-mail: windu_irawan@yahoo.co.id Abstract The trading of injected / wet broiler chicken (chicken that has been injected with water) is traded in big city, markets and traditional markets in almost all parts of Indonesia. Traders are ambitious to achieve greater profits, while the public (consumers / buyers) lack knowledge, oriented towards low prices, consume just to meet the needs of a full stomach. Both traders and the public do not pay attention to the risk of injected / wet broiler chicken meat. The objective of the research was to analyze the organoleptic aspects and the number of germs between healthy broiler chicken meat and injected broiler chicken meat. This study is Descriptive research type with observational approach. Population includes "unclear or uncertain population", primary data with organoleptic and laboratory tests, compared with quality standards Decree of the Directorate General of [Drug and Food Control Number](#) 03726 / B / SK / VII / 1989 [concerning](#) Maximum Limit of Microbial Contamination in Carcass Meat Foods and Frozen Boneless Meat, analyzed using table analysis, then described. The results of organoleptic research on healthy broiler chicken meat: white-yellow, bright, shiny, clean, when touched feels moist and non- sticky, specific smells of meat, consistency of elastic chest muscles and thighs, elastic, white carcass and muscle fibers little white pale, blood vessels in the neck and wings have no blood. Injected broiler chicken meat: wetter, water was found on the underside of the skin, more soft, when raised it dripped water, when sliced across it released water. The number of germs of healthy broiler chicken meat is 185,333 cabbage / gram, does not exceed the quality standard, fulfills the requirements and is suitable for consumption. The average number of injected broiler chickens is 1,388,333 col / gram, exceeds the quality standard, does not meet the requirements, and it is not suitable for consumption. It is recommended that further research be conducted on the behavior of the sellers of injected chicken and the types of microbes found in the injected chicken meat. Keywords: injected broiler chicken, organoleptic, germ rate. I. INTRODUCTION Information about chicken meat is important to the public. Chicken meat is a source of protein that contains amino acids which is very needed to create an intelligent and healthy Indonesian society, and avoid "losing generation". Chicken meat is a commodity that is relatively cheap and easily to get , and accepted by all people. By conducting studies, research, counseling on the chicken meat is expected to increase public awareness to consume high nutritious foods (Tjandra Yoga Aditama, 2010). Chicken meat is relatively cheaper in price compared to other meats, so it is consumed more by people from various economic levels. Chicken meat that is safe, healthy, whole and halal is the meat that is expected by all consumers. Healthy chicken meat should not contain pathogenic microbes, and if they contain it the amount

must be small. Microbial growth in chicken meat is closely related to the quality of fresh / healthy chicken meat (Tjeppey D. Soedjana, 2010). Business actors involved in the process of cutting broiler chickens (broilers) to the sellers (marketing) of chicken meat are very numerous and varied in their education level, so that it often happens many irregularities activities in handling and trading (marketing) of chicken meat in food industry, super market, large markets, traditional markets, chicken slaughterhouses, home industries, street vendors and others (Caroline, 2008). The emergence of trading of injected or wet meat broilers (chickens that have been injected with water) in the markets, cause a lot of public anxiety , because it is possible to be harmful to health and also violate the Law (UU) No. 18 of 2012 concerning food, and Republic of Indonesia [Law Number 8 of 2000 concerning consumer protection](#). The ignorance [of](#) the public about the spread of injected broiler chicken meat causes anxiety / fear for them to buy chicken meat because it is thought to contain bacteria. Although theoretically it doesn't belong tot carcasses but injected chicken meat has been forbidden by the Indonesian Ulema Council. Injected broiler chicken meat has excess fat content and the bacteria contained in it are thought to be more numerous. Fats found in broiler chicken meat can cause humans to suffer from gout, nerves, impotence and heart disease. Besides that the moisture content is also susceptible to infected with bacterial diseases. Meat with high water content will be easily overgrown with germs (Tjandra Yoga Aditama, 2010). The case of selling injected chicken meat in DKI Jakarta. The expensive price of meat and the high demand of meat during fasting and around Eid is the cause of the case. (M. Dindien Ridhotulloh, 2008). The Livestock and Fisheries Service of Sumedang Regency, West Java, discovered and detected many injected chicken meat sold in traditional markets. About 80% of chicken meat sold by traders in the market with high water content from the injection was found (Cecep Hidayat, 2008). The Livestock and Fisheries Service of Karanganyar Regency, Central Java, found chicken meat injected in Palur Market. Injected meat has high water content, a pH above 5.5. Such pH levels are not normal. Scars of injection are found on the surface of chicken meat and consequently chicken meat is easily decayed (Muhammad Hatta, 2009). In Legi Market of Songgolangit, Ponorogo Regency, East Java, found injected broiler chicken meat with different colors and characteristics compared to chicken meat in general, looked very wet and when removed the meat dripped quite a lot of water and broiler chicken meat became soft due to the large amount of water (Dhysad Jawa Post , 2010). It appears that the circulation of injected broiler chicken meat has spread everywhere, because these data only represent a small portion of the actual data that in every region of Indonesia there have been similar cases. [The purpose of this study was to analyze the](#) comparison [of](#) organoleptic aspects and the number of germs in healthy broiler chicken meat with "glongongan" (injected) broiler chicken meat. II. METHOD A. Types of research This research is descriptive research with an observational approach, to describe comprehensively organoleptic aspects including color, odor, texture and taste, as well as the number of germs in healthy broiler chicken meat and injected broiler chicken meat (Soekidjo Notoatmodjo, 2010). B. Research design The research design used was a comparative study, this method used a comparative study method. It was carried out by comparing the differences as phenomena (Soekidjo Notoatmodjo, 2010). Organoleptic aspects include color, smell, texture and taste. The number of germs of healthy broiler chicken meat and injected broiler chicken meat compared to the Quality Standard Decree of the [Directorate General of Drug and Food Control](#) Number 03726 / B / SK / VII / 1989 [concerning the Maximum Limit of Microbial](#) Contamination [in](#) Foods [of](#) Carcass Meat and Boneless Frozen Meat. C. Population and Sample The research subjects that identified were the meat of healthy broiler chickens and injected broiler chicken meat, analyzed and compared about the organoleptic aspects and the number of germs. The entire research subject was called the study population. Each research subject was a member of the study population. The state of the subject under study is called the research object. The population in this study included "Unclear or uncertain population", because the presence and number of injected broiler chickens that were traded were unknown or unclear. The sale of injected broiler chickens was rather difficult to know its existence because it was not traded every day, the sales process tends to be clandestine, injectable broiler chickens sold were also uncertain in number, including the number of traders, it was impossible to take samples from the population fairly, giving equal opportunities to each member to be taken into probability (sampling) or take a sample by random sampling. Because it did not provide a fair opportunity (equal) to each member of the population to be sampled, the sampling technique was grouped in a nonprobability sampling cluster, which was a sampling method that did not give equal opportunity to each member to be taken as a sample or nonrandom sampling (technique of taking non-random sample). The nonprobability sampling technique [used in this study](#) was [purposive sampling](#), which purposely took samples [according to the requirements](#) (natures, characters, [characteristics, criteria](#)) of a sample that reflected the population, or in Javanese terms called "njujug" sampling techniques, headed directly to places (areas, regions, locations) that many members of the population were in, so this study did not necessary to used sampling area techniques (geographical and / or administrative areas). [Purposive sampling is also called judgmental sampling](#), which is [sampling based on](#) "judgment" (judgment) [of the](#) researcher regarding a decent broiler (fulfilling the [requirements](#)) to be [sampled. In order not](#) to be [very subjective](#), researchers already [have](#) a [background](#) of [knowledge about the](#) population and [sample](#) in question, so that they can really [get a sample](#) that is [in accordance with the requirements or](#) objectives of the study (obtaining accurate data). The number of purposive samples taken, the formula as much as is considered sufficient to obtain research data that reflects (representative) state of the population. Data from purposive samples are considered to be able to describe (answer) the objectives and problems of the research. In this way: 1) The demand of the researcher to get a suitable sample can be achieved. 2) "intentionally" (planned / purposively) looking for members of the population directly to the market ("njujug") , because it is clearly more effective and efficient rather than looking everywhere but get no information. (Amirin, Tatang M., 2011). D. Research variable The

independent variable is the meat of healthy broiler chicken and injected broiler chicken meat. The dependent variable is the organoleptic aspect (color, odor, texture and taste) and the number of germs found both in the meat of healthy broiler chicken and in injected broiler chicken meat. Disturbing variables are water, inorganic salts, minerals, nitrogen sources, CO₂, Growth factors (yeast extract, blood and vitamins of B complex, Vitamin of E complex), Oxygen (O₂), Oxidation potential - reduction, Temperature and pH. E. Research sites Broiler chicken meat samples were taken from the Legi Market located in Songgolangit of Ponorogo Regency, East Java, with consideration ("suspected") it will found the traders of injected broiler chicken meat there. Organoleptic tests and test the number of germs were carried out in the Laboratory of Microbiology, Diploma III Study Program, Environmental Health, Campus of Magetan. F. Processing and analysis of data In this study, researchers processed and analyzed data obtained from observations and laboratory examinations by: Editing: that is to re-examine the collected data to find out whether the data is ready to be processed in the next process. Coding: that is the grouping of data that has been edited according to its type according to a predetermined level and to distinguish data. Analysis: Data from field observations are compared with related references and laboratory data compared to Standard Quality Decree of the [Directorate General of Drug and Food Control](#) No. 03726 / B / SK / VII / 1989 concerning Maximum Limit of Microbial Contamination in Carcass and in Boneless Frozen Meat. Analyzing process is using table analysis, the data that has been collected is analyzed in the form of table analysis, then described. III. RESULTS A. Analysis of organoleptic observations. The results of observations of healthy broiler chicken meat with injected broiler chicken meat using organoleptic methods, as follows: 1. Healthy broiler chicken meat: a) Color aspect: bright yellowish white, not dark, not pale, not bluish, not too red, looks fresh. Yellowish white skin, bright, shiny, clean, fresh, no bruising, no water. Yellowish white fat evenly under the skin with soft consistency. The inside of the carcass and white muscle fibers are rather pale, the size of the stretch is large and uneven. b) Odor aspect: specific characteristic of chicken meat (no pungent smell, no rancid smell, no foul odor), fresh no strange smell. c) Texture aspect: when touched feels moist and not sticky (dry), when pressed with finger is elastic / back as before and not chewy. The consistency of the muscles of the chest and thighs is supple, elastic (not mushy), less dense consistency. d) Other aspects: blood vessels in the neck and wings are empty (no remnants of blood), fine meat fiber, between the meat fibers there is no fat. Perfect confirmation, no defects, no signs of bruising or other suspicious signs. There are no needle marks on the carcass / chicken meat. If it is fried, there are not many sparks, the meat is not infested by flies. Injected broiler chicken meat: a) Color aspects: pale brownish, shiny, look more wet (watery). Shiny, clean skin, found under the wing and watery injection marks on the chest and thighs of chicken, white fat evenly under the skin with soft consistency, the inside of the carcass and muscle fibers are pale white b) Smelly aspect: changed from the typical smell of chicken meat (stinging rancid smell). c) Texture aspect: when touched feels moist and sticky (not dry). When pressed by finger is not elastic and chewy. Consistency is like a balloon inflating containing water / wind, because it has high water content. d) Other aspects: blood vessels in the whole body are not visible (no remnants of blood), felt soft because there is water at the bottom of the layer of chicken skin, meat / carcass looks thicker, bigger / fat, unusual compared to normal chicken size , in the wings, the injection marks are visible. When fried like frying water (lots of sparks), the meat is infested by flies. B. The results of the analysis of the results of examination of the number of germs. Based on laboratory tests, the average number of germs on healthy broiler chicken meat is 185,000 col / gram, while for injected broiler chicken meat is 1,388,333 col / gram. Complete results as follows: Table 1. Results of Examination of the Number of Germs in Healthy Broiler Chicken Meat and in Injected Broiler Chicken Meat

No	Examination	Number of Germs in Chicken Meat	Healthy Broilers	Injected Broiler
1.	I	151,000 col/gram	150,000 col/gram	255,000 col/gram
2.	II	1,200,000 col/gram	1,270,000 col/gram	1,695,000 col/gram
3.	III	185,333 col/gram	1,388,333 col/gram	
4.	IV	Average	185,333 col/gram	1,388,333 col/gram

A. Analysis of organoleptic observations DISCUSSION Healthy broiler chicken meat: Based on observations of healthy broiler chicken meat in accordance with the characteristics of chicken meat that is safe, fresh, healthy, whole and halal. All the characteristics above are fulfilled because broiler chicken meat sold comes from chicken meat that is still alive, healthy and through the right slaughter process, so that broiler chicken meat is declared to be eligible and suitable for consumption by consumers (the public). Injected broiler chicken meat: When the meat has contact with outside air in a long time will cause changes in oxygoglobin to metmyoglobin (MMb) and the color of the meat turns brown. If metmyoglobin is contaminated with bacteria, the meat will turn green. This happens because the formation of sulfmyoglobin and cholemyoglobin, due to oxidation and denaturation quickly changes to porphyrin in yellow to brown (Arka, 2008). Many factors influence the color of meat including food, species, nation, age, sex, stress (level of activity and muscle type), pH and oxygen (Soeparno, 2005). Changes in the smell of meat can be influenced by the surrounding environment, temperature, storage methods, equipment and packaging used (Soeparno, 2005). Consistency of meat is usually expressed by firmness, softness, juiciness. Meat consistency is determined by the amount of connective tissues that make up the muscles. Generally, people process food only to meet the needs of full stomach, people knowledge is still limited about injected broiler chickens. The consumers / people just want to make a profit because the price of the meat is considered cheap and the taste is still delicious . Another reason is the customers/ people have low purchasing power because prices of meat always rise before fasting month, Eid or religious and national holidays. Food quality control in Indonesia is considered weak , due to limited personels and costs, so this weaknesses are often used by traders and / or seasonal traders to get more profit. Traders and / or seasonal traders are ambitious to gain more profit, traders believe making shortcuts is the best way. The method is the chicken that has been pulled out of the hair and separated from the innards, injected with water on the armpits of the wings, thighs, chest and back. The goal is that the small chicken meat will balloon its body to be large and shiny. Injecting and trading are carried out by the

traders themselves secretly, because they are afraid of being arrested by the officers. The size of the injected chicken meat is also varies, the weight ranges [Dama International Journal of Researchers, www.damaacademia.com, editor@damaacademia.com](http://www.damaacademia.com) 155 from 700 grams - 900 grams. Even though there are also those that are sold with greater weight. The turnover in sales is bigger and more profitable, because one piece of chicken meat when injected will contain 1 ounce of water. Although sold at a lower price, the price can actually be more expensive than fresh meat. Because, about 30-40% of the weight of meat is water. If buying one kilogram of meat means the actual weight is about 6 or 7 ounces. Injected meat has high water content and consequently easily rotten. During the research process, it is found a number of injected chicken meat, especially in the lower part of the wing and chest with injected holes. But when it was confirmed, traders said that "the hole was used as a hair removal device instead of an injection, broiler meat that was sold was cut by themselves, even when bought chicken, they chose directly in the chicken field". When tested with a moisture level measuring 5.9. Normally, with a measuring instrument of meat content ranging from 5.0 to 5.5 so that the meat of the broiler chicken is suspected of being the result of an injection. Buyers / consumers / communities and traders do not know what substances are contained in injected broilers, whereas injected broilers clearly contain excessive fat and contain a lot of water. Fat found in injected broiler chickens can cause humans to suffer from gout, nerves and impotence in the heart. Water content is caused by meat carcasses that have been injected with water or air which contain germs and will multiply in chicken meat. The existence of bacteria in broiler chicken meat that comes from injection water can accelerate the decay process due to the presence of pathogenic bacteria, can cause poisoning if consumed by the public, so that the meat of injected broiler chicken is declared ineligible and not healthy for consumers consumption.

B. Analysis of the results of examination of the number of germs.

Healthy broiler chicken meat: Based on laboratory examinations obtained the results of examination of the number of germs in healthy broiler chicken meat an average of 185,333 col/gram, while the limit of quality standard requirements Decree of the [Directorate General of Drug and Food Control](#) No. 03726 / B / SK / VII / 1989 concerning Maximum Limit of Microbial Contamination in Foods of Carcass Meat and Frozen Boneless Meat, especially in healthy chicken meat which is 106 colonies / gram. As stated in the table below:

Table 2. Results of Examination of the Number of Germs in Healthy Broiler Chicken Meat	
No Examination Standard	Quality
Number of Germs	1. 2. 3. I II III
106 col/gram	106 col/gram
150,000 col/gram	151,000 col/gram
255,000 col/gram	255,000 col/gram
Average	185,333 col/gram

This shows that the number of germs of healthy broiler chickens does not exceed the quality standard Decree of the Directorate General of [Drug and Food Control](#) Number 03726 / B / SK / VII / 1989 concerning the Maximum Limit of Microbial Contamination in Foods of Carcass Meat and Frozen Boneless Meat especially in healthy chicken meat, which is 106 colonies / gram. It is possible because healthy broiler chicken meat is obtained from chicken meat that is still alive, healthy and through the right slaughter process, so that broiler chicken meat sold in the market meets the requirements for trading and safe to consume by consumers.

Injected broiler chicken meat. Based on laboratory examination, the results showed that the average number of germs on injected broiler chicken meat was 1,388,333 col / gram. From the average results, it is clear that the number of broiler chicken meat germs exceeds the quality standard. Decree of the [Directorate General of Drug and Food Control](#) No. 03726 / B / SK / VII / 1989 concerning Maximum Limit of Microbial Contaminants in Foods of Carcasses and Frozen Boneless Meat especially in healthy chicken meat is 106 colonies / gram. As stated in the table below:

Table 3. Results of Examination of Number of Germs in Injected Broiler Chicken Meat	
No Examination Standard	Quality
Number of Germs	1. 2. 3. I II III
106 col/gram	106 col/gram
1,200,000 col/gram	1,200,000 col/gram
1,270,000 col/gram	1,270,000 col/gram
1,695,000 col/gram	1,695,000 col/gram
Average	1,388,333 col/gram

Water media is good for the growth of various bacteria, bacilli and viruses. An increase in the number of spoilage / pathogenic microbes affects the safety and durability or shelf life of meat. The presence of bacteria in meat can accelerate the process of decay, and the presence of pathogenic bacteria cause food poisoning if consumed by [Dama International Journal of Researchers, www.damaacademia.com, editor@damaacademia.com](#) 156 consumers, can also suffer damage to the liver, kidneys, heart and cancer that causes death. There are also diseases that can be transmitted by chicken meat, salmonellosis, which is transmitted from chicken meat to humans, because salmonella is a bacteria that is present in contaminated foods and also from undercooked foods from infected animals. In chicken meat there are also viruses that have not been studied and identified, namely Avian Influenza virus which is known to contaminate the chicken itself. The existence of these contaminants will result in infection in humans if they have contact with poultry or consume the meat. The following are the results of the laboratory sample test of number of germs on meat of healthy broiler chicken and on injected broiler chicken meat:

Table 4 Results of Examination of the Number of Germs in Healthy Broiler Chicken Meat and in Injected Broiler Chicken Meat	
No Examination	Quality
Standards Healthy meat	Number of Germs of Broiler Chicken
Injected meat	1. I 106 col/gram
151,000 col/gram	1,200,000 col/gram
2. II 106 col/gram	150,000 col/gram
1,270,000 col/gram	3. III 106 col/gram
255,000 col/gram	1,695,000 col/gram
Average	185,333 col/gram
1,388,333 col/gram	V. CONCLUSION

[Based on the results of the analysis](#) and discussion, can be drawn as the following conclusions:

1. Organoleptic observation.
 - a. Healthy broiler chicken meat: safe, fresh, whole, healthy and halal. [Meet the requirements and](#) are [safe to consume by](#) consumers (community).
 - b. Injectable broiler chicken meat does not [meet the requirements](#) / not [safe to consume by](#) consumers (community).
2. Number of germs.
 - a. Healthy broiler chicken meat does not exceed the quality standard Decree of the [Directorate General of Drug and Food Control](#) No. 03726 / B / SK / VII / 1989 [concerning the Maximum Limit of Microbial](#) Contaminants in Foods of Carcass Meat and Frozen Boneless Meat. It is Fulfill the requirements and deserve and safe to be consumed by consumers (community).
 - b. Injected Broiler chicken meat exceeds the quality standard Decree of the [Directorate General of Drug and Food Control](#) No. 03726 / B / SK / VII / 1989 [concerning the Maximum Limit of Microbial](#) Contamination in Foods of Carcass Meat and

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