



## Effect of Some Vinegar Types on Sensory and Chemical Characteristics of Aged Chicken Meat

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**Abstract:** The research aims to study the control effect of some vinegar types available in the local market (apple cider vinegar, white vinegar, dates vinegar, and grape vinegar) at 4-6% acetic acid and 3 pH on the sensory and chemical characteristics of the aged chicken meat during two different periods (4 and 8 hours). The treatment of soaking (thigh and breast) for aged chicken meat with different types of vinegar for a period of 4, 8 hours has led to a significant improvement in the characteristics of tenderness, color, flavor, and palatability of the meat. There was a significant decrease in the juiciness of the meat and percentage of loss decreases whenever the soaking process exceeds 4 hours. Furthermore, the treatment of soaking the thigh and breast for aged chicken meat with different types of vinegar for a period of 4, 8 hours also led to a significant increase in protein, lipid and ash, and a significant decrease in moisture whenever the period of soaking exceeds 4 hours. It can be concluded that it is possible to improve the sensory and chemical characteristics of aged chicken meat when soaked with vinegar for a period not exceeding four hours and best vinegar used to improve these characteristics is grape vinegar.

**Keywords:** Apple cider vinegar, White vinegar, dates vinegar, Grape vinegar, Flavour, Chicken

There is a close relationship between human food and health for physical fitness, gain strong immunity against diseases by eating balanced and integrated food that contains all the nutrients. Among the most important healthy nutrients are meat is an important source of proteins that contain essential amino acids and a large group of vitamins, especially the B group, as well as containing important minerals such as zinc, iron, and phosphorous. Despite all these benefits the consumers lack of knowledge about the correct ways to make it palatable and more tenderness. The annually marketed in the world is of 250 million aged chickens (1.5 years old) and there are 2.6 billion chickens that are spent and not used for human consumption (Navid et al 2011). This type of chicken is not desirable by consumers due to the lack of tenderness of its meat because of aging, due to the high percentage of lipid and low protein. The low water holding capacity in meat leads to the low moisture content and a change in the nature of collagen and the connective tissues, so the meat is dry with fibrous textures. There are many ways to improve the sensory characteristics of aged chicken meat and increase tenderness. This emphasized decrease in the pH of meat after slaughter leads to increase the denaturation of muscular proteins and increased its tenderness. The anaerobic decomposition of glycogen leads to an increase in pyruvic acid release, increase in the activity and release of cathepsins enzymes that degrade protein synthesis and decrease pH (Lawrie 1998). Many techniques are used to improve the

characteristics of meat, especially the characteristic of tenderness, because of the economic returns for producers and consumers (Solomon et al 2008). Among these techniques, mechanical tenderization and electrical stimulation were also observed to be effective (Hopkins et al 2006). The use of the ageing technique was also used widely where the meat is cooked at a temperature (2°C) for a period of 10 - 14 days, but main drawbacks is economics. It also needs large storage areas and may lead to oxidation of lipid and change the meat colour and may increase in microbial growth. The other techniques include use of plant enzymes, such as the enzymes papain (bromelin and ficin). However, all techniques are not widely accepted due to high cost and inefficiency or may affect some of the quality characteristics of meat. Thus study aims to find the best suitable solutions to improve the quality characteristics of meat by studying the effect of different types of vinegar on the sensory and chemical characteristics of the aged chicken meat for different periods.

### MATERIAL AND METHODS

Thirty-six chickens were taken from a commercial herd of laying hens from the strain ISA-Brown of age 1.5-year-old with an average weight of 1.8-2 kg. The chickens were slaughtered and placed under the heat stress for two minutes at a temperature of 54°C, where the feathers were removed and the internal organs were removed. Then, the carcasses were washed with water and left in cold water at a