

## EFFECT OF COOKING TEMPERATURE ON WARNER–BRATZLER SHEAR FORCE AND COOKING LOSS IN TWO TYPES OF IRAQI AWASSI LAMBS MUSCLES

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**ABSTRACT :** The effect of three cooking temperatures (50°C, 70°C, 90°C) and their interaction with two type of muscles *Biceps brachii* (BB) and *Biceps femoris* (Bf) on Warner-Bratzler shear force value in five Iraqi Awassi lambs in age of nine months was investigated. The increasing of cooking temperatures always followed with significant decreasing in SF values. The lowest value was belonging to the treatment of 90°C, which recorded 4.4 Kgf and 2.5 Kgf for BF and BB muscles, respectively. No significant differences were recorded between treatment of 50°C, 70°C in SF values for the two types of muscles. The trait of cooking loss percentage was affected significantly with increasing cooking temperatures as well. The percentages of cooking loss were increased with increasing cooking temperatures significantly. The highest percentage 36.42% appeared in the treatment of 90°C as a cooking temperature, while the lowest one 10.54% was belong to cooking temperature of 50°C.

**Key words :** WARNER – BRATZLER, shear force, cooking loss, awassi lambs.

### INTRODUCTION

The notion of meat quality always describes the average of all meat sensory, chemical, physical, biochemical, technological properties (Abdulla *et al*, 2008; Arrubaii, 2011). The quality of meat can be defined also as a group of properties that limits acceptance and palatability of meat by the consumer (Laakkonen, 1970). Many researches referred to tenderness as the major attribute of all others in determine meat quality (Dawson, 1991; Larick and Turner, 1992; Rao and Lund, 1986; Ouali, 1999) the contrary and complementary of tenderness is toughness, an attribute that being limited by two essential factors: myofibril toughness and collagen existence (Joo *et al*, 2013). This two essential factors may be affected by fundamental factors as what mentioned by Honikel (1998) like gender, nutrition state, degree of physiological maturity, muscle location, cooking temperature, etc. and all these factors interact with and effect of each other's to bounding the final tenderness (or toughness) of meat (Bertola *et al*, 1994).

On the other hand, many of method have been designed to can evaluate tenderness easily, precisely and as fast as it can, but one of the fine method to do that is using the WARNER–BRATZLER shear force method,

because evaluation of tenderness by which would be out of personal judgment and expressed by a digit number the matter that ensures the highest level of preciseness (Kadim *et al*, 1993; Lawrie and Ledward, 2006). Manufactured meat could be affected with all the factors that regulate tenderness in general as what mentioned before (Goll *et al*, 1995; Murphy and Marks, 2000), but the most important factors may be the type of muscle and the cooking temperature (Jasim *et al*, 2008).

So, our research is to investigate the effect of three levels of cooking temperature (50, 70, 90°C) on cooking loose and shear force values by using W-B like device in two kinds of muscles (*Biceps brachii* and *Biceps femoris*) in Iraqi Awassi lambs.

### MATERIALS AND METHODS

A five Iraqi awassi male lambes have age 9 month were used in this experiment, each of which was slaughtered according to the traditional Islamic procedure, and the *Biceps brachii* (BB) and *Biceps femoris* (Bf) muscles were taken from the left side of the body anatomically. The muscles were cut to three equal pieces (three pieces for each muscle), in order to conducting them to cooking procedure, before exposing to the cutting pressure under W-B shear force device. At first the