

## ANTIMICROBIAL ACTIVITY OF CHITOSAN AND/OR GUM ARABIC IN THE LOCAL PRODUCE SOFT AND HARD CHEESE IN BAGHDAD CITY

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**ABSTRACT :** The antimicrobial activities of chitosan and/or Gum Arabic as aqueous antimicrobial solutions against Coliforms, *E. coli* O157: H7, yeasts and molds were evaluated by agar well diffusion method. Chitosan (CH) exhibited best antimicrobial activity against the treated microorganisms at concentration of (5%) with contact time for 6hrs at refrigeration temperature (4°C), zones of inhibition for (GA) and (CH) for each solution alone ranging from (0 to 10 mm), chitosan solution (CH) exhibited both antibacterial and antifungal activities, Gum Arabic washing solution showed significant antibacterial activity ( $P < 0.05$ ) against the microorganisms at concentration (15%), without inhibitory effect against *E. coli* O157:H7 at concentration (10%), in the current study the results confirmed that (15%) (w/v) of GA and 5% (w/v) of chitosan were the optimum concentrations as the disinfected washing solution to reduce the contamination the local Iraqi cheese products but without complete elimination, these results support the possibility of using these solutions an alternative strategy to minimized the contamination of these local products. The main objectives of the current study to evaluated effectiveness of edible washing / coating solutions of chitosan and/or Gum Arabic as antimicrobial solutions or natural preservatives substances for enhancing the safety of one of the most popular local products in Iraq.

**Key words :** Gum Arabic, chitosan, antimicrobial solutions, *E. coli* O157:H7, yeasts and molds.

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### INTRODUCTION

For food safety, edible coating biopolymers and another food additive (food-grade) has been used, these substances composed of polysaccharides (includes the gum and /or carbohydrates) also can composed from proteins and /or lipids (Gennadios *et al*, 1997). Due to the capacity of chitosan for the film-forming, it was protecting, enhance and extend both of fresh and processed foods shelf life (Carmen *et al*, 2010). Major kinds of microorganisms such as Bacteria and fungus are causes the spoilage for food and food products, diseases that are pathogenic to humans can caused by bacteria and fungi, therefore to reduce the risk of these infections, many of natural antimicrobial substances with highly antimicrobial activity were used to prevent such these infections (Ebtihal *et al*, 2020). In Iraq Local cheeses produced in the farmers houses in the rural area and immediately delivered to Baghdad markets after cheese making, in local markets due to inappropriate handling and environment circumstances, microbial quality of soft and salted cheese (hard cheese) can affect

through the contaminated by different kinds of spoilage and pathogenic organisms. Gum Arabic (GA), Chitosan (CH), whey protein, pectin, carboxymethyl cellulose and alginate substances are used as coating and as edible films with the antimicrobial characterization these substances can applied on another kinds of foods such as, fruit and vegetables (Mohapatra *et al*, 2013). Gum Arabic used industry in many kinds of food such as ice cream, jellies, different types of candies, drinks, beverages, syrups and chewing, gums as emulsifying, binding material, stabilizing, and thickening agents, characterized by desirable properties as soluble in water, classified under the (GRAS list) generally recognized as safe substances for edibility without effect on the taste and flavors (Patel and Goyal, 2015). Arabian traders played important role in both of its popularity in the Europe and acquired its name, Sudan, and many other countries in Africa such as Senegal, Chad, Nigeria, and Ethiopia are the major sources of (GA), in Arabian regain Sudan considered the biggest exporter in the word up to (80%) of the GA trade, chitosan is a natural biopolymer classified by the (FDA) as Generally