



# **Effect of direct acidification on some microbiological and technological properties of raw milk cheese**

By

**Ahmed Abd-Elhady Abd-Elghany Mohamed**

B.Sc. Agric. Sci. (Dairy Sci.), Fac. of Agric., Fayoum Univ., (2016)

**Thesis**

Submitted in Partial Fulfillment of the Requirements for the Degree of

**Master of Science**

In

**Agricultural Science (Dairy Science)**

**Dairy Department**

**Faculty of Agriculture, Fayoum University, Egypt**

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**SUPERVISION COMMITTEE**

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## ABSTRACT

***In the present study***, GDL, acetic, citric and lactic acid were used to study their effects on the growth, inhibition or activation of pathogenic and lactic acid bacteria in terms of pH values, cell concentrations, total viable counts and microbial growth rates. In addition, organic acids were used in the production of raw milk hard cheese, studying its physicochemical, microbiological, ripening indices and sensory properties. **The study was handled in three parts as follow:**

***Firstly***, the used organic acids inhibited the growth of *Salmonella enteritidis*, *Staphylococcus aureus*, *Bacillus cereus*, *Escherichia coli* and *Pseudomonas aeruginosa*. GDL had the higher inhibition effect among other organic acids, followed by lactic acid, citric acid, while acetic acid had the lower inhibition effect. The inhibition of GDL continued at pH 5.2, while *Staphylococcus aureus* and *Salmonella enteritidis* were totally inhibited by GDL at pH 5.2. The effect of other organic acids for total inhibition of pathogens was pronounced only till pH 4.8.

***Secondly***, organic acid promoted the growth of *Lactobacillus acidophilus*, *Streptococcus thermophilus*, *Lactobacillus bulgaricus*, *Lactobacillus paracasei*. Citric acid was more effective for enhancing the growth of lactic acid bacteria followed by lactic acid, GDL and the lower effect was observed with acetic acid. Citric acid promoted the growth of all lactic acid bacteria when compared with other organic acids.

*Thirdly*, organic acid affected the physicochemical properties of the produced cheese, improved the amino acid and fatty acid profiles of cheese samples with acids when compared to control cheese. In addition, organic acid affected the total viable count of cheese and enhanced the microbial growth of lactic acid bacteria. Cheese samples with organic acids did not receive the required appreciation from the panelists. GDL had received higher sensorial scores followed by lactic acid in the context of flavor intensity.

**Key words:** Organic acids, GDL, Acetic, Citric, Lactic, pH, Cell concentration, viable count, Microbial growth rate, hard cheese, Amino acids, Fatty acids, Sensory evaluation.