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STUDIES ON THE ULTRASTRUCTURE OF CHICKEN EGGSHELL AND ROLE OF PROSTAGLANDIN IN DETERMINING IT'S QUALITY

By

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DEDICATION

To My Mother's Soul

الى روح والدتى أهدى رسالتى

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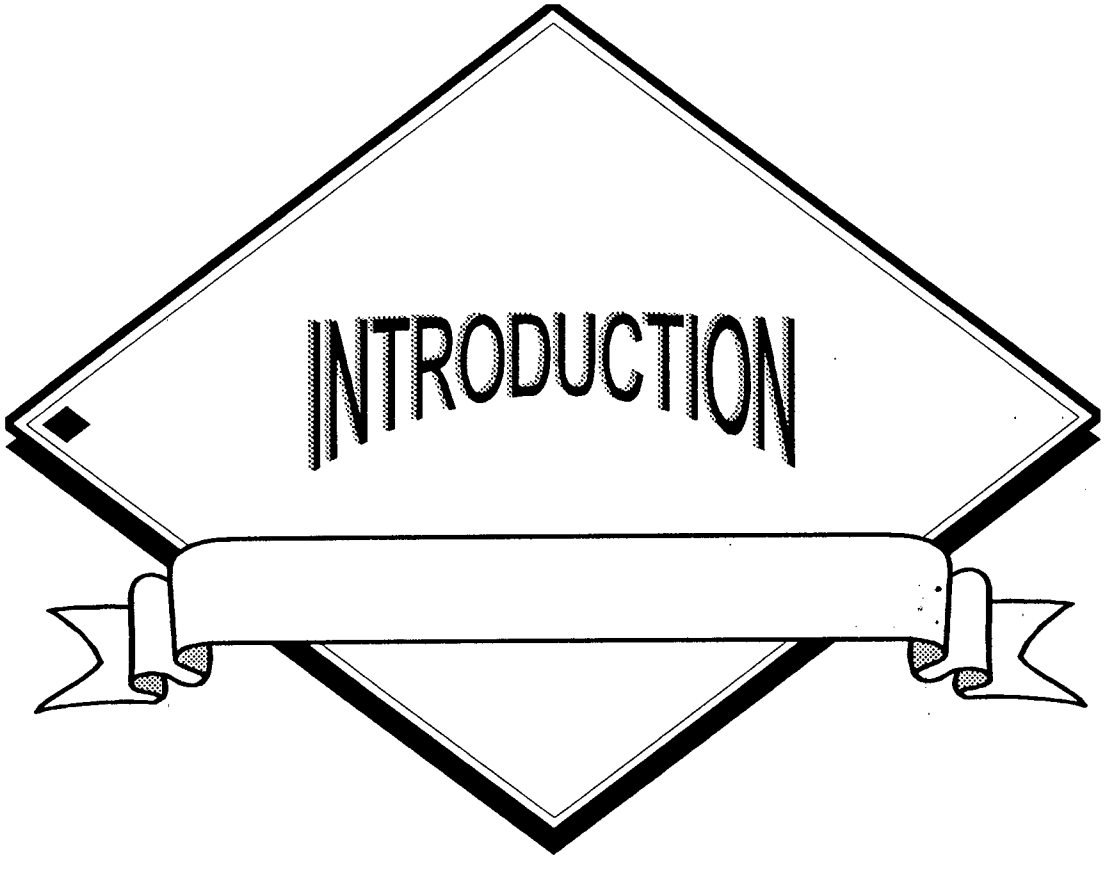
INTRODUCTION

1.INTRODUCTION

Although it represents no more than 10% of the weight of egg, the shell is a vital, and for everyone involved in producing, marketing and consuming eggs, the most visible. Producers and marketers rely on the eggshell to protect and contain the food contentes of the egg untill these are used by the consumer. Everyone in this chain of production and consumption is interested in reducing the breaking of eggs. Egg breakage lead to the wastage or at least downgrading of the entire egg contents.

According to ***Hunton*** **(1995)**, losses of eggs worldwide due to damaged shells exist despite recent advances in research, quality control, and applied technology.

The losses sustained by the commercial egg industry, worledwide, are difficult to estimate. Estimates of average of total eggs cracked or lost prior to reaching their final destination have been shown to range from 13 to 20% (***Roland,*****1988**). According to the statistics of 1995 world hen egg production reached about 740,000 million eggs (hatching eggs are included in this figure). (Watt Poultry Statistical Yearbook, 1996). Thus the losses sustained by the commercial egg industry amounted to form 96,200 to 148,000 million eggs, which , if priced at US 60c/dosen, would be worth $ 4810-7400 million in that year. The losses sustianed by Egyptian egg industry on this basis reached about £.E 62.4 to 95.9 million in 1995 (total egg production 2,822 million eggs).

One of the main factors leading to poor eggshell quality is insufficient shell calcification due to premature oviposition.

Prostaglandins are involved in the oviposition of normal hard-shelled eggs. Plasma concentration of prostaglandin increases immediately before and during oviposition and then decreases following expulsion of the egg

(***Hertelendy et al.*** **1975**; ***Hertelendy*** and ***Bielellier*** **1978b**, ***Hester et al.*** **1991**; ***Hargrove*** and ***Ottinger***, **1992**; ***Etches***, **1996**).

Premature release or synthesis of endogenous prostaglandin may cause some eggs to be laid prematurely before an adequate shell is formed (***Hester et al.*** **1991**). Therefore it has been suggested that giving hens a suitable dose of any prostaglandins inhibitor, may delay oviposition and hence allowing the shelled egg to stay more time in the uterus, giving the chance for complete shell deposition and resulting in a thicker eggshell. Acetylsalicylic acid (aspirin, ASA) and indomethacin belong to those drugs known as prostaglandin inhibitors. Results of experiments of using ASA in poultry showed contradictory results regarding its benificial effects as a prostaglandin inhibitor (***Balog et al.*** **1993**). Therefore, the present experiments was carried out mainly to:

1- Compare the physical and ultrastructural characteristics of normal and abnormal shelled eggs.

2- Study the possibility of improving eggshell quality by oral administration of ASA through its action as a prostaglandin inhibitor.