

# **MECHATRONICS**

# **BOOK SERIES**

**SYSTEM DESIGN AND SIGNAL PROCESSING**

**VOLUME 2**

---

**Editors**

**Md. Raisuddin Khan**

**Md. Mozasser Rahman**

**Muhammad Mahbubur Rashid**

**Shahrul Na'im Sidek**



**IIUM PRESS**

**INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA**

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Published by:  
IIUM Press  
International Islamic University Malaysia

First Edition, 2011  
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Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

ISBN: 978-967-418-132-1

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM  
(Malaysian Scholarly Publishing Council)

Printed by :  
**IIUM PRINTING SDN.BHD.**  
No. 1, Jalan Industri Batu Caves 1/3  
Taman Perindustrian Batu Caves  
Batu Caves Centre Point  
68100 Batu Caves  
Selangor Darul Ehsan  
Tel: +603-6188 1542 / 44 / 45 Fax: +603-6188 1543  
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## CHAPTER 16

### INTELLIGENT EGG INCUBATOR: INTRODUCTION

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#### 16.1 Introduction

Food industry is a one major industry that rapidly growing nowadays. There are many types of food industries that are beneficial and highly demanded by the communities. One of them is the chicken industry which has also become a very important food industry since the chicken meats and eggs are being consumed by almost everyone at almost every meal time. In chicken industries, they usually include the farms where the primary activity is to raising the chickens for the production of eggs and meats.

The chicken industry is basically an industry where people keep the domesticated birds for the purpose of collecting their eggs or killing them for meat or feather. More than 50 billion chickens are reared annually as a source of food, for both their meat and their eggs [1]. Chickens farmed for meat are called broilers, while those farmed for eggs are called egg-laying hens.

Majority of the chicken poultry farms are being supplied by livestock from hatcheries industry. Hence, in order to successfully develop the chicken egg industries, the hatchery industries must be well maintained and must be able to keep up with the demand of the chicken industry. To achieve that, it is very important for the hatchery industry to ensure that the young chickens are genetically selected for fast growth. In addition research or device creation aiming at improving the sustainability of hatcheries with a primary focus on egg and chicken meat production is also important to stabilize chicken industry.

Incubator machines are being utilized in the hatchery industries to help the production of young chickens [2]. Incubator required a controlled environment in producing the young chickens from the eggs. This process is usually started from selecting good eggs to hatching stage. After selecting the eggs, the pre-incubation time is required before setting the incubator for incubating stage. During the incubation, the fertility and candling must be done to ensure the damage eggs can be taken out, so that they will not affect the good eggs.

Under controlled environment, hatching period can vary from one species to another species. Table 1 shows the estimated period and conditions for hatching process for different species where the hatching process can produce a successful hatched product up to 95%. If the hatching process is done by the hens, under uncontrolled environment, the percentage of hatched eggs will be less due to some problems as shown in Table 16.2 and Table 16.3 [1].

#### 16.2 Artificial Hatching Process

Artificial hatching process using an incubator can take a quite long period of time and