

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

MODELLING OF QUAIL EGGS  
USING CUBIC BEZIER CURVE

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**IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL**

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## ABSTRACT

It has remained for long unresolved the influence of egg size on hatchability and its nutrients. Although many researchers had conducted numerous experiments to find mathematical equation of egg profile, but still there was no research on quail eggs using Bezier Curve yet. So, this project “Modelling of Quail Eggs Using Cubic Bezier Curve” was decided to be conducted in order to give some contribution to poultry industry and quail marketing. 20 quail eggs were collected and labelled after cleaning and air drying. Their volumes were measured using Archimedes’ principle. Then by applying Cubic Bezier Curve using Maple software, the best fitted curve of quail eggs was produced and from that their volumes were calculated by applying formula for volume involving parametric equation and also the percentage error by comparing them with actual volume calculated using Archimedes Principle. Thus, from this project, it was hoped that it did contributed to poultry industry and also helped consumers to choose the eggs wisely.

# 1 INTRODUCTION

## 1.1 INTRODUCTION

A quail is a small bird that inhabit woodland and forest areas around the world. Known as the smallest bird subspecies, the domestic quail *Coturnix Coturnix Japonica* is breed in farms for its meat and eggs production (Teusan Anca & V., 2008). According to an article "Quail Eggs and Health", quail eggs are proved to be a very valuable source of vitamins A, B1, B2, B6, B12 and vitamin D, iron, magnesium, zinc, copper, phosphorus and other essential micro-nutrient, minerals amino acids, which is why they are recommended for regular consumption. Although they are small in size, their nutritional value is believed to be 3-4 times greater than chicken eggs (Tanasorn Tunsaringkarn, 2013).

Quail eggs are considered a special dish in many parts of the world, including Europe, North America and Kerala in India. In Japanese Cuisine, quail eggs often found in bento lunches and sometimes, they are used raw or cooked as tamago in sushi. (Oguwike F. N & M.C, 2014) Consuming raw quail eggs is recommended to make it parts of a healthy diet eventhough lots of people do not like the idea. According to Tanasorn Tunsaringkarn (2013), regular consumption of quail eggs helps to resist various diseases apart from strengthening the immune system, promoting memory health, increasing brain activity and stabilizing the nervous system. Quail eggs also considered to be one of the best known natural treatment products. The article "Quail Eggs and Health" also states that for hundred years, Chinese medical practitioners have been using quail eggs as a treatment that gives positive results.

Berkhout (2009) stated that according to the East Coast Economic Region secretariat, the demand for quails increase 20-25 percent each year since 1995. Article "Quail Production Boost in Malaysia and Abroad" mentions that demand for quails are not only rising in the East Coast but also on the international level. This is because the quail eggs marketing is getting