

**UNIVERSITI TEKNOLOGI MARA**

**THE EFFECTS OF SOY TEMPEH DIET  
ON ENDOCRINE  
AND REPRODUCTIVE FUNCTION**

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## **ABSTRACT**

The aim of the study was to find out whether soy tempeh diet would significantly affect the male endocrine and reproductive system. The result shows that daily diet of soy tempeh significantly reduced TSH, T<sub>3</sub> and testosterone hormone. Tempeh diet also significantly caused a delay in male sexual maturation (puberty) by about  $2.64 \pm 1.43$  days in the treated group ( $42 \pm 1.57$  days) compared to controls ( $39.36 \pm 1.28$  days). The observed effects by soy tempeh diet may be attributed to its genistein content. Genistein disrupts reproductive function by disrupting enzyme systems that regulate testosterone synthesis and the synthesis of thyroid hormones.

# CHAPTER 1

## INTRODUCTION

### 1.1 Research background

Tempeh is a soybean based food produced by controlled fermentation by white *Rhizopus* mold on cooked soybean which binds them into compact cake. It originated from Indonesia and migrated with Indonesian travelers to Southeast Asia. Presently, it is widely consumed on the west and south coast of Peninsular Malaysia (Shurtleff, 2007). It has firm texture and nutty flavor. It is a complete source of protein as it contains all the essential dietary amino acid, fat plus the fiber.

Soybean is phytoestrogenic due to its isoflavone content, which are non-steroidal estrogenic compound that occur naturally in many plants (Naz, 2004). Soy has high concentration of conjugated forms of genistein and daidzein (isoflavones) (Bennetau-Palissero *et.al.*, 2001). Soybean can contain about 560 to 3810 mg isoflavone/kg, depending on the variety and growing conditions (Naz, 2004). In tempeh particularly, the concentration of isoflavone is 865mg/kg. Boiling reduces the level of genistein but baking or frying does not alter the isoflavone content (Rozman *et.al.*, 2006). Traditionally fried tempeh is the most consumed.