



UNIVERSITI TEKNOLOGI MARA

**COMPARISON EFFECT OF CARBOHYDRATE TYPES IN
ISOTONIC AND SUGARCANE DRINK ON ENDURANCE
PERFORMANCE**

OCHILLOCHANDERN GITTOM ANGANG

2016690656

**BACHELOR OF SPORTS SCIENCE (HONS.)
FACULTY OF SPORTS SCIENCE AND RECREATION
UNIVERSITI TEKNOLOGI MARA SARAWAK**

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ABSTRACT

Carbohydrate is defined as a chemical substance that composed of carbon, hydrogen and oxygen. Carbohydrates types in isotonic drink is glucose that produce fast energy and carbohydrates types in sugarcane drink is sucrose that was combine of glucose and fructose that need a time to produce energy. Two difference types of carbohydrate produce energy to improve endurance performance with differences metabolism steps for allow the cells to access energy. The objective of this study was to investigate the differences effect of carbohydrate types in isotonic drink and sugarcane drink on endurance performance and total of sweat loss production among long distance runner athletes. One group subjects (N=30) were given two treatments (treatment 1: Sugarcane drink, treatment 2: Isotonic drink) to measure the cardiovascular endurance performance (VO₂max) and total sweat loss. The bleep test has been used to measure the cardiovascular endurance (VO₂max) among long distance runner athletes (N=30). The result showed there was significant different effect of carbohydrates type in isotonic drink and sugarcane drink on endurance performance (VO₂max) and total sweat loss ($p < 0.05$). However, based on the mean different, isotonic drink significant higher on endurance performance (VO₂max) and total sweat loss than sugarcane drink. Thus, the different types of carbohydrate intake provided different effect on endurance performance and sweat loss production.

Key Words: Endurance performance, Total sweat loss, Isotonic drink, Sugarcane drink.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

The sugarcane looks like a tall grass with a stout, jointed and fibrous stalk that similar looks just like a bamboo (McCaffrey, 2016). Sugarcane family-owned Poaceae such as *Saccharum officinarum* is one of the most hybrid varieties grown among sugarcane types (Ansari, Yadav, & Lal, 2013). In Malaysia, there are five species of sugarcane such as *Saccharum officinarum*, *Saccharum robustum*, *Saccharum barberi*, *Saccharum sense*, and finally *Saccharum spontaneum* (Hoque, 1998). The type of sugarcane (*Saccharum officinarum*) produces most of the water-soluble carbohydrates, such as sucrose-type (Slewinski, 2012).

Sugarcane (*Saccharum officinarum*) is better known as noble cane due to the high content of sucrose and low fiber content among all types of sugarcane in worldwide (Abbas, Sabir, Ahmad, Boligon & Athayde, 2013). The sucrose accumulation in sugarcane stems begins after vegetative growth has been finished (Batta, Kaur, Sital, Sandhu & Uppal, 2011). Sugarcane such as (*Saccharum officinarum*) is a renewable biomass feedstock because its availability plants produce the highest yield of carbohydrate and high sugar content (Eggleston & Lima, 2015). The ability of sucrose accumulative in sugarcane stem depends on the ability of sucrose cleavage in sugarcane is catalyzed by two enzymes (sucrose synthase and

CHAPTER 2

LITERATURE REVIEW

2.1 TYPES OF SUGARCANE

Based on Hoque (1998), he states that in Malaysia, there are only five species of sugarcane such as *Saccharum officinarum*, *Saccharum robustum*, *saccharum barberi*, *saccharum sinense*, and *spontaneum saccharum*.

2.1.1 *Sugarcane saccharum officinarum*

A sugarcane *saccharum officinarum* have a thick stem, juicy and hardly, perennial plant, row in clumps with a green, pinkish, or purple stem also this sugarcane tall can reach up to 5 meters height, have green leaves with 30-60cm length and have the highest content of sucrose compare to all sugarcane type (James, 2004).

2.1.2 *Sugarcane saccharum robustum*

In its natural habitat, sugarcane *saccharum robustum* is the species of sugarcane that often vigorous, forming compact tufts, with grow up to 10 meters high and sugarcane *saccharum robustum* is often used as fences in New Guinea country and one time, it was thought to offer new scope in sugarcane breeding (James, 2004).