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## Effects of addition juice date palm to the extender on the percentage of live and motility of frozen thawed bull spermatozoa

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### Abstract

The objective of the present study was to investigate the effects of supplementation of juice date palm to the extender on post-thaw percentage of live and motility in bull semen. A total of four Bali bull cattle were used to the study. Juice date palm was added at the concentration of 0.1%, 0.2%, 0.3% and 0.4% to bovine semen cryoprotective medium. The cryoprotective extender for the control group was the same as that for the treatment groups except that it was not supplemented with juice date palm. The results indicated that percentage of live sperm and motility on fresh sperm was no significant different ( $P > 0.05$ ) between control and all treatments. Whereas, sperm motility of frozen thawed was significantly different ( $P < 0.05$ ) between control and all treatments. Furthermore, percentage of live sperm was no significant different ( $P > 0.05$ ).

**Keywords:** Juice date palm, spermatozoa, frozen thawed, percentage of live and motility

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### Introduction

Date palm is one of the oldest fruit crops grown in the Arabian Peninsula, North Africa, and the Middle East. Fruits of date palm (*Phoenix dactylifera* L.) is rich in mineral salts and vitamins (Booijet al., 1992). Dates contain small amounts of vitamins C, B1 thiamine, B2 riboflavin and nicotinic acid (Al Shahibet al., 2002), and studies have shown that dates have strong antioxidant (Al Farsi et al., 2005). Date palm fruits consist of 3 main parts: date flesh, date pit, and skin. The glucose, fructose and sucrose are the main sugars of date flesh. The palm date fruit has a high content of sucrose at early stages of maturing, but during the maturation process it is converted to glucose and fructose. Proteins appear in date fruits as 1–3% of dry matter, while its fat content was reported to be 0.52–3.25% (Myharaet al., 1999). Existing sugar palm juice is an important ingredient for sperm. Thus, the objective of this study was to investigate the effects of addition juice date palm to the extender on the percentage of live and motility of frozen thawed bull spermatozoa.

### Materials and Methods

This study was conducted at the artificial insemination center Banjarbaru south Kalimantan Indonesia. A total of four Bali bull cattle were used to the study. The cryoprotective extender for the treatments follows: skim milk, glucose, egg yolk and glycerol according to Bustamante et al. (2009), and was supplemented with different concentrations of juice date palm from Aljazirah

Ltd with 0.1%, 0.2%, 0.3%, and 0.4 %.The cryoprotective extender for the control group was the same as that for the treatment groups except that it was not supplemented with juice date palm. The semen was collected from the bali cattle bulls as long as two month with the aid of an artificial vagina. Immediately, after collection, the semen was kept in a water bath (37°C), and semen parameters were assessed, including volume, pH, consistency, color and concentration of the semen. The percentage of live sperm was evaluated using eosin-nigrosin stain according to Dott&Foster (1972) whereas, the analysis motility of sperm was adopted from Hanget al. (2009).

## Results and discussion

The effect of addition juice date palm to the extender on the percentage of live and motility of frozen thawed bali bull spermatozoa has been presented in table 1 and 2. Based on the evaluation of fresh semen are shown in table 1, overall parameters of sperm characteristic were considered as standard. The sperm motility of frozen thawed are shown in the table 2.

Table 1. Percentages of fresh sperm including percentage of live sperm and motility.

Item	Control	Concentration of juice date palm (%)			
		0.1	0.2	0.3	0.4
Percentage of live sperm (%)	81.25±5.56	80.50±3.11	79.62±5.94	80.15±4.75	79.10±4.40
Motility (%)	73±2.43	75±1.05	74±4.12	72±2.57	72±1.90

Table 2. Percentages of sperm of frozen thawed including percentage of live and motility.

Item	Control	Concentration of juice date palm (%)			
		0.1	0.2	0.3	0.4
Percentage of live sperm (%)	61.75±4.06	68.50±1.02	67.50±1.96	61.75±1.78	65.25±3.25
Motility (%)	43.50±1.00 <sup>a</sup>	41.25±1.26 <sup>ab</sup>	39.75±1.26 <sup>b</sup>	36.00±1.41 <sup>c</sup>	31.00±2.94 <sup>d</sup>

<sup>a-d</sup>Values in the same row with different superscripts indicate significant difference (P<0.05).

The assessment of percentage of live sperm and motility is one of the most often used parameters for semen evaluation. The results of this study indicate that percentage of live sperm and motility shown decreased between fresh semen and post thawed. Cryopreservation is a major cause of damage to the sperm thawed (Hauganaet al., 2007; Hong *et al.*, 2009). These was probably due to the induction of reactive oxygen species (ROS) produced from cryopreservation can also induce of damage sperm thawed (Mammotoet al., 1996; Alemayehu, 2011). On the other hand mitochondria are the source of sperm energy, and damage to their structure during the cryopreservation process is associated with reduced post-thaw including sperm viability and motility (Ortega et al., 2008).

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