



UNIVERSITI PUTRA MALAYSIA

**COMPARISON OF MILK PRODUCTION AND COMPOSITION OF
SAANEN AND SHAMI - JAMNAPARI CROSSBRED GOATS**

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UNIVERSITI PUTRA MALAYSIA
SERDANG, SELANGOR
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**COMPARISON OF MILK PRODUCTION AND COMPOSITION
OF SAANEN AND SHAMI - JAMNAPARI CROSSBRED GOATS**

BY

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A project report submitted to Faculty of Agriculture,
Universiti Putra Malaysia, in fulfilment of the requirement of
SHW 4999 (Final Year Project) for the award of the degree of
Bachelor of Agriculture (Animal Science)

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CERTIFICATION

This project entitled ‘Comparison of Milk Production and Composition of Saanen and Shami-Jamnapari Crossbred Goats’ is prepared by Solehah binti Sairuddin and submitted to the Faculty of Agriculture in fulfilment of the requirement of SHW 4999 (Final Year Project) for the award of the degree of Bachelor of Agriculture (Animal Science).

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TABLE OF CONTENT

TITLE	PAGE
CERTIFICATION	ii
ACKNOWLEDGEMENT	iii
TABLE OF CONTENT	iv
LIST OF TABLE	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
ABSTRAK	xi
CHAPTER 1: INTRODUCTION	
1.1. Background Industry	1
1.2. Research Problem	2
1.3. Research Hypothesis	2
1.4. Objectives	
1.4.1. General Objective	2
1.4.2. Specific Objectives	3
CHAPTER 2: LITERATURE REVIEW	
2.1. Shami Goat	4
2.2. Saanen Goat	5
2.3. Jamnapari Goat	6
2.4. Dairy Goat Milk Composition	8
CHAPTER 3: MATERIAL AND METHODS	

3.1. Study Location	9
3.2. Experimental Material	9
3.3. Experimental Design	9
3.4. Methodology	10
3.5. Statistical Analysis	11
CHAPTER 4: RESULTS	
4.1. Milk Yield	12
4.2. Milk Composition	14
4.3. Correlation between milk yield and milk composition	20
CHAPTER 5: DISCUSSION	
5.1. Milk Yield	28
5.2. Milk Composition	28
5.3. Correlation between milk yield and milk composition	30
CHAPTER 6: CONCLUSION	34
REFERENCE	35
APPENDICES	36

LIST OF TABLES

TABLE		PAGE
4.1	Analysis of variance of milk yield at 1 collection to 4 collection	13
4.2	Analysis of variance of milk composition at the 1 st collection	16
4.3	Analysis of variance of milk composition at the 2 nd collection	17
4.4	Analysis of variance of milk composition at the 3 rd collection	18
4.5	Analysis of variance of milk composition at the 4 th collection	19
4.6	Correlation between milk yield and milk composition in 1 st Collection	21
4.7	Correlation between milk yield and milk composition in 2 nd Collection	23
4.8	Correlation between milk yield and milk composition in 3 rd Collection	25
4.9	Correlation between milk yield and milk composition in 4 th Collection	27

LIST OF FIGURES

FIGURE		PAGE
1	Shami Goat	5
2	Saanen Goat	6
3	Jamnapari Goat	7



LIST OF ABBREVIATIONS

kg	Kilogram
ml	Millilitre
°C	Celcius
GLM	General linear model



COMPARISON OF MILK PRODUCTION AND COMPOSITION OF SAANEN
AND SHAMI-JAMNAPARI CROSSBRED GOATS

By

Solehah binti Sairuddin

ABSTRACT

The self-sufficiency level for milk goat in Malaysia is very low, only 12.93% in 2014. Despite that, some farmers in Malaysia are crossing the Shami goat with Jamnapari as well as Saanen producing Shami crossbreds to serve as milk producers. There is a need to evaluate the milk production and quality of Shami goats and their crosses in Malaysia. There are very limited published studies on the milk quality of the Shami goats, and none of those in Malaysia. This study was conducted to evaluate the milk quality and production of Saanen and Shami-Jamnapari crossbreds. The specific objectives of this study were to evaluate the milk composition and production of purebred Saanen and crossbred Shami goats at different stages of lactation to examine the differences in the milk composition of the two breed types and to determine the association between the various milk quality traits investigated in the breed types. Two breed types of dairy goats at a dairy goat farm in Batang Benar, Nilai were used, namely the purebred Saanen goat and the Shami-Jamnapari crossbred. Twenty lactating goats were used (10 Saanen goats and 10 Shami-Jamnapari crossbred). These does were randomly selected from the lactating animals at the farm. The age of the does were between 1-5 years. The does were in early to late lactation. The experimental design that was used is

completely randomized design. Milk samples were collected twice daily (morning at 6 a.m. and evening at 4 p.m) on alternate weeks over two months. Milk samples (20 ml) were collected from the lactating goats. The milk collected at each milking was weighed and recorded. Samples (20 ml) of the milk collected in the morning were transferred to the laboratory in ice for analysis of the milk composition. The date of kidding for each doe were recorded to determine days in milk. The milk samples were stored at 4°C for 24 hours before being analysed for milk components using the MilkoScan™, an infrared based milk analyser. All the milk samples were analysed in triplicates and the average of the results were recorded. Effect on breed by lactation number interaction showed no significant ($P>0.05$) difference for milk yield at all four collections. Breed showed a significant ($P<0.05$) effect on milk yield only at the first collection. There were no significant ($P>0.05$) differences between the breeds for second to fourth collection. Lactation number showed no significant ($P>0.05$) effect on milk yield for the four collections. Breed by lactation number interaction effect was not significant ($P>0.05$) for all milk composition traits. Breed showed a significant ($P<0.05$) effect on fat A, fat B, protein, lactose, total solid and solid-non-fat. There was no significant ($P>0.05$) effect of lactation number on fat A, fat B, protein, total solid and solid-non-fat, but lactation number showed a significant ($P<0.05$) effect on the lactose content.

PERBANDINGAN PENGELUARAN DAN KOMPOSISI SUSU SAANEN DAN
SHAMI-JAMNAPARI KAMBING KACUKAN

Oleh

Solehah binti Sairuddin

ABSTRAK

Tahap sara diri untuk kambing tenusu di Malaysia adalah sangat rendah, hanya 12.93% pada tahun 2014. Walaupun begitu, beberapa petani di Malaysia, mengacukkan kambing Shami dengan Jamnapari dan juga Saanen menghasilkan kacukan Shami untuk digunakan sebagai pengeluar susu. Terdapat keperluan untuk menilai pengeluaran susu dan komposisi susu bagi kambing Shami dan kacukan Shami di Malaysia. Tidak banyak kajian yang diterbitkan tentang kualiti susu kambing Shami, dan tiada satu kajian pun di Malaysia. Kajian ini dijalankan untuk menilai kualiti susu dan pengeluaran susu Saanen dan Shami-Jamnapari kacukan. Tujuan utama kajian ini adalah untuk menilai komposisi susu dan pengeluaran susu Saanen dan Shami kacukan di pelbagai peringkat laktasi untuk mengetahui perbezaan komposisi susu kedua-dua jenis baka dan untuk menentukan hubungan antara pelbagai ciri-ciri kualiti susu disiasat dalam jenis baka. Dua jenis baka kambing tenusu di sebuah ladang tenusu kambing di Batang Benar, Nilai telah digunakan, iaitu kambing Saanen dan Shami-Jamnapari kacukan. Dua puluh kambing tenusu digunakan (10 kambing Saanen dan 10 Shami-Jamnapari kacukan). Kambing dipilih secara rawak daripada haiwan yang menyusu di ladang. Umur adalah di antara 1-5 tahun. Kambing berada di awal hingga akhir penyusuan.

Rancangan yang digunakan adalah reka bentuk rawak. Sampel susu dikumpulkan dua kali sehari (pagi pada 06:00 dan petang pada 4 petang) pada minggu alternatif di antara dua bulan. Sampel susu (20 ml) telah dikumpulkan daripada kambing menyusu. Susu yang dikumpul pada setiap perahan susu telah ditimbang dan direkodkan. Sampel (20 ml) susu yang dikumpul pada waktu pagi telah dipindahkan ke makmal dalam ais untuk analisis komposisi susu. Tarikh pengumpulan bagi setiap kambing telah direkodkan untuk menentukan hari dalam susu. Sampel susu telah disimpan di 4°C untuk 24 jam sebelum dianalisis untuk komponen susu menggunakan MilkoScan™. Semua sampel susu dianalisis dalam tiga kali dan purata keputusan telah direkodkan. Interaksi baka dan bilangan penyusuan tidak menunjukkan kesan ketara ($P > 0.05$) ke atas hasil susu di keempat-empat koleksi. Baka menunjukkan kesan yang ketara ($P < 0.05$) dalam pengeluaran susu hanya pada koleksi pertama. Ia tidak menunjukkan kesan ketara ($P > 0.05$) pada koleksi kedua hingga keempat. Bilangan penyusuan juga tidak menunjukkan kesan yang ketara ($P > 0.05$) terhadap pengeluaran susu pada keempat-empat koleksi. Kesan interaksi baka dan bilangan penyusuan tidak ketara ($P > 0.05$) untuk semua komposisi susu. Baka menunjukkan kesan ($P < 0.05$) ke atas lemak, A lemak B, protein, laktosa, jumlah pepejal dan pepejal bukan lemak. Tidak ada perbezaan ($P > 0.05$) kesan bilangan penyusuan terhadap lemak A, B lemak, protein, jumlah pepejal dan pepejal bukan lemak, tetapi bilangan penyusuan menunjukkan kesan ($P < 0.05$) ke atas kandungan laktosa.

CHAPTER 1

INTRODUCTION

1.1 Background Industry

Breeding and selection programs of dairy goats are widely carried out in many countries and this has led to the development of some specialized breeds (Dubeuf et al., 2004; Morand-Fehr & Lebbie, 2004). Breeding should be taken into account in long-term planning of any animal production enterprise to guarantee the optimization of available resources and the return of investments. Breeding programs are basically designed to identify superior genotypes for different traits of economic interest, based on performance information of animals and their relatives as well as on molecular information, in order to disseminate their genes in the population (Cardoso et al., 2014). After India, the Mediterranean area is the main goat milk and goat cheese producer (Dubeuf et al., 2004). Goat milk is an important nutritional resource in view of its high digestibility and tolerability, and its physicochemical characteristics make it one of the preferred human milk substitutes (Haenlein, 2004). In the eastern Mediterranean region (Lebanon, Syria, Cyprus), the Shami goat is popular among farmers for its high performance (milk yield and twinning). Malaysia too has developed dairy goat farming to serve a niche market with importation of dairy goat breeds from various countries. Among the imported dairy breeds are Saanen and Shami goats. In Malaysia scientifically based information on dairy goat farming is very limited (Jamaluddin et al., 2012).

1.2 Research Problem

There are very limited published studies on the milk quality of the Shami goats (Khazaal, 2009; Rawya & Ahmed, 2014), and none of those in Malaysia. Despite that, some farmers in Malaysia are crossing the Shami goat with Jamnapari as well as Saanen producing Shami crossbreds to serve as milk producers. There is a need to evaluate the milk production and quality of Shami goats and their crosses in Malaysia.

1.3 Research Hypothesis

Some studies conducted showed the average milk yield of the Shami goats to be slightly higher compared to Saanen. Milk production and composition of the Shami goats has been reported to be similar to that of Saanen (Khazaal, 2009). Hence, it is expected that milk production of Shami crossbreds are better than Saanen purebred while the composition of milk is similar.

1.4 Objectives

1.4.1. General Objective

The general objective of this study was to evaluate and compare the milk quality and production trait of two breeds of goat, namely the Saanen goat and Shami-Jamnapari crossbred.

1.4.2. Specific Objectives

The specific objectives of this study are:

- To evaluate the milk composition and production of purebred Saanen and crossbred Shami-Jamnapari goats at different stages of lactation;
- To examine the differences in the milk composition of the two breed types;
- To determine the association between the various milk quality traits investigated in the breed types.



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