



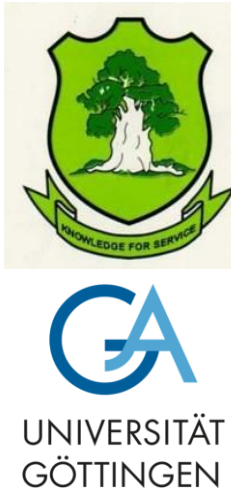
Influence of Cow Breed and Location on Milk Quality Properties and West African Soft Cheese Yield

Matthew Atongbiik Achaglinkame^{*1,2}, Linda Dari¹, Daniel Mörlein²

^{*} Corresponding author: machaglinkame@uds.edu.gh

¹ University for Development Studies, P.O. Box TL 1882, Tamale, Ghana

² University of Göttingen, Department of Animal Sciences, Germany



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Introduction

Ghana has diverse cow breeds, yet there is a notable paucity of information on how these breeds differ in milk quality, and by extension West African soft cheese yield and nutritional quality. This study, therefore, explored the influence of cow breed and farm location on milk composition and soft cheese (“Wagashi”) yield.

Materials and Methods

- Milk samples were collected from four cow breeds (Boboji, Degeji, Mossiji & Yakanaji) from two locations (Achubunyor in West Gonja & Kasalgu in Tamale, Ghana).
- The nutritional composition of the milk samples was analysed before cheese processing using ultrasonic milk analyser (SP-013556, Milkotronic Ltd).
- West African soft cheese (“Wagashi”) was processed (Fig. 1) using *Calotropis procera* leaves as coagulant.

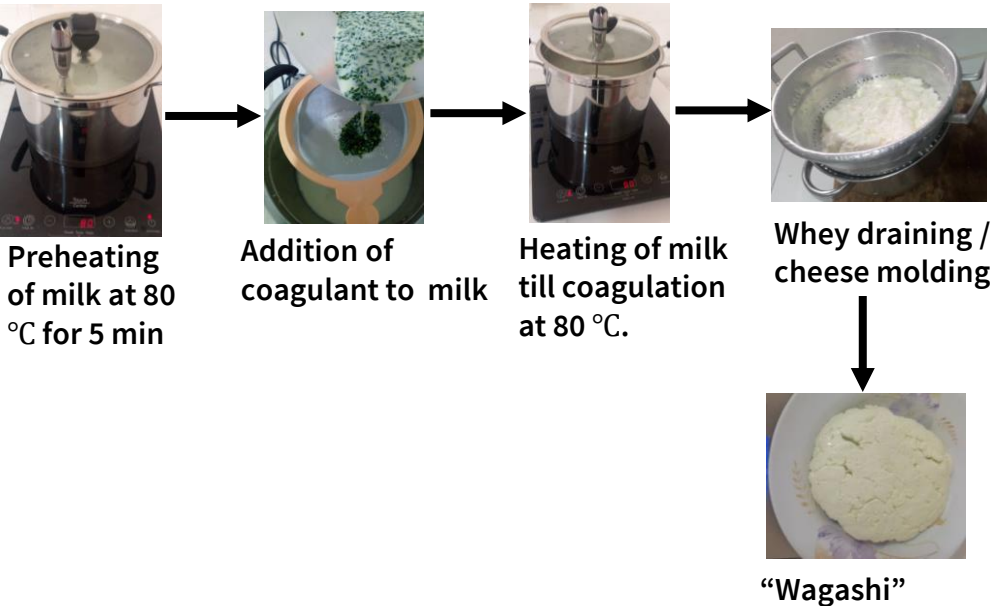


Fig. 1: “Wagashi” processing flowchart.
Source: Achaglinkame (2024)

Conclusion

- The findings underscore breed and location influence cow milk composition as well as “Wagashi” yield and its nutritional value.
- The findings also point to management and/or diet effects as well as individual animal effects.
- The high cheese yields obtained herein point to best practices that could improve cheese processors' income.

References

- Chikpah, S. K. et al. (2014). Effects of different concentrations of fresh and dried *Calotropis procera* (Sodom apple) extract on cow milk coagulating time, cheese yield and organoleptic properties of West African soft cheese (Wagashie). *European Scientific Journal*, 10(27), 317–326.
- Ogundiwin, J. O., & Oke, O. L. (1983). Factors affecting the processing of Wara-A Nigerian white cheese. *Food Chemistry*, 11(1), 1–13.

Results & Discussion

- The findings indicate that both breed and location, as well as their interaction, significantly ($p<.05$) influenced the milk and cheese attributes as well as cheese yield, except solid non-fat content (8.39-8.60%) of the milk.
- The cheese yields (31.1-39.9%) obtained were relatively higher than the 13.5-33.7% (Chikpah et al., 2014; Ogundiwin & Oke, 1983) reported in literature for using only cow milk as milk source and *C. procera* as a coagulant.

Table 1: Effect of breed and location on milk nutritional composition (*as-is* basis)

Location	Breed	Fat (%)	Protein (%)	Lactose (%)	Total solids (%)
Achubunyor	Boboji	4.94±0.68 ^{ab}	3.16±0.05 ^a	4.77±0.07 ^a	13.64±0.56 ^{ab}
	Degeji	4.76±0.37 ^{ab}	3.05±0.02 ^c	4.60±0.02 ^c	13.15±0.34 ^{bc}
	Mossiji	5.83±0.01 ^a	3.07±0.00 ^{bc}	4.66±0.01 ^{bc}	14.32±0.01 ^a
	Yakanaji	4.12±0.01 ^b	3.13±0.00 ^{ab}	4.72±0.00 ^{ab}	12.71±0.01 ^c
Kasalgu	Boboji	5.66±0.02 ^a	3.08±0.00 ^{bc}	4.66±0.01 ^{bc}	14.16±0.03 ^a
	Degeji	5.70±0.04 ^a	3.08±0.00 ^{abc}	4.67±0.00 ^{bc}	14.21±0.05 ^a
	Mossiji	5.70±0.03 ^a	3.08±0.00 ^{bc}	4.66±0.01 ^{bc}	14.19±0.03 ^a
	Yakanaji	5.72±0.02 ^a	3.06±0.01 ^{bc}	4.64±0.01 ^{bc}	14.17±0.00 ^a
P-value		0.014	0.008	0.006	0.007

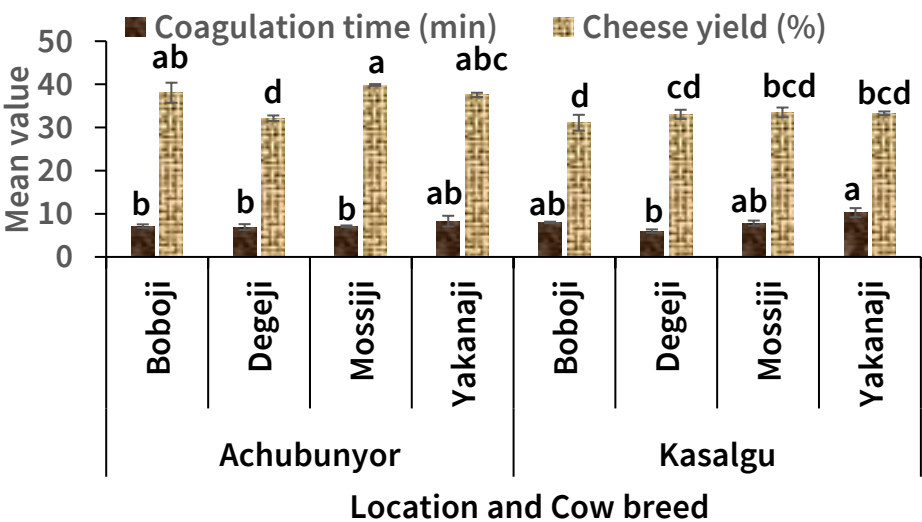


Fig. 2: Effect of breed and location on ccoagulation time and “Wagashi” yield

Table 2: Effect of breed and location on nutritional composition (*as-is* basis) of “Wagashi”

Location	Cow breed	Moisture (%)	Fat (%)	Protein (%)	Carbohydrate
Achubunyor	Boboji	60.63±1.58 ^{ab}	19.01±0.62 ^c	12.08±0.56 ^{bcd}	5.02±0.26 ^{bc}
	Degeji	61.73±0.72 ^{ab}	16.33±0.44 ^d	10.18±0.17 ^d	8.73±0.01 ^a
	Mossiji	57.42±1.38 ^{bc}	22.27±1.13 ^a	12.41±0.45 ^{bc}	4.24±0.32 ^c
	Yakanaji	63.40±0.05 ^a	16.89±0.62 ^{cd}	11.34±0.72 ^{cd}	5.40±1.40 ^{bc}
Kasalgu	Boboji	53.49±0.41 ^c	21.70±0.77 ^{ab}	14.04±0.71 ^{ab}	6.77±1.09 ^{ab}
	Degeji	60.41±3.93 ^{ab}	19.12±1.74 ^c	12.11±1.51 ^{bcd}	5.09±0.34 ^{bc}
	Mossiji	59.62±0.61 ^{ab}	19.43±0.20 ^{bc}	10.25±0.16 ^d	7.47±0.59 ^a
	Yakanaji	59.59±2.09 ^{ab}	18.39±0.77 ^{cd}	14.71±0.70 ^a	4.10±0.44 ^c
P-value		0.003	<0.001	<0.0001	<0.0001



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