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► To cite this version:

Patrice Gaborit, Hugues Caillat, Julien Clochet. Impact of grass-based diets on the qualities of milk and goat cheeses: Hay vs Pasture. 10. Cheese Symposium, Apr 2018, Rennes, France. 1 p., 2018. hal-02788991

HAL Id: hal-02788991

<https://hal.inrae.fr/hal-02788991>

Submitted on 5 Jun 2020

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Impact of grass-based diets on the qualities of milk and goat cheeses

Hay vs Pasture

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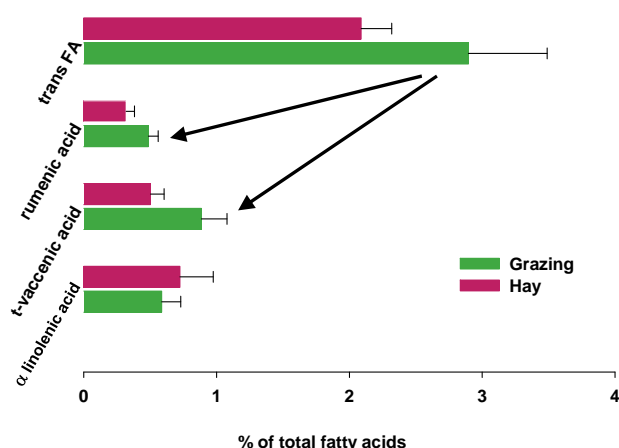
A greater use of grass in the fodder and feed systems is a preponderant axis for the sustainability of the goat milk farms in front of economic constraints and societal expectations: increase of concentrate feed costs, strengthening of the fodder autonomy for cheeses with official quality label (PDO, Organic farming), animal welfare, environmental protection, preservation of cheeses quality and naturality. Even though grazing is a much studied topic in animal feed, little research has been done on animal product processing and quality assessments.

Material and methods

In partnership with Patuchev experimental set-up (UE FERlus - INRA Lusignan – France), biochemical (overall composition, fatty acids) and microbiological characteristics (lactic acid bacteria, non-starter lactic acid bacteria, yeasts and moulds) were analyzed in raw milks and cheeses (ripened lactic type cheese) made from 60 grazing goats and 60 non grazing goats (hay – indoor feeding) during 3 milk years (2015 – 2016 - 2017). Acidification capacity of milks, cheese yields, fat and proteins recovery, sensory characteristics of cheeses and consumers acceptance were also evaluated.

Results

- Higher % of minors fatty acids of nutritional importance in “grazing milks”: more *trans*-vaccenic acid and rumenic acid
- Minors fatty acids of nutritional importance in “grazing milks” recovered in cheeses

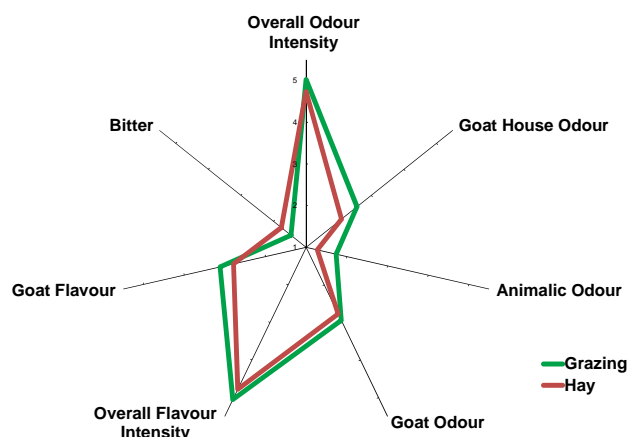


- No off-flavor defects detected for cheeses made with “grazing” and “hay” milks
- Sensory qualities considered very acceptable by consumers, since 74% of them were ready to eat these cheeses again
- Higher goat house odour and goaty flavour in cheeses made with “grazing” milks

Milks characteristics	Pasture	Hay	P
SSC (log/ml)	6.32	6.12	s
Lipolysis (meq/100g FM)	0.91	0.46	s
Fat (g/kg)	36.69	37.58	ns
Proteins (g/kg)	33.76	33.81	ns
Caseins (g/kg)	26.72	26.35	ns
NPN (g N/kg)	0.31	0.45	s

- Higher SSC and lipolysis for “grazing milks”, but lower NPN
- No difference between milks regarding cheese yields, recovery rates, and acidification capacities.

Sensory profile of ripened cheeses (D+30)



Grazing increases the part of minors fatty acids of nutritional importance in milks which and in cheeses. Though, in contrast to other case studies, part of MUFA and PUFA are similar between “hay” and “grass” diets. Once the diet stabilizes, grazing does not affect technological abilities of milks and cheeses qualities, consumer acceptance being very good. “Grazing cheeses” present also a more typical goaty aroma.