



63rd Annual Meeting EAAP, August 27th – 31st 2012, session 16



Sampling procedure during milking and between quarters on the assessment of colostrum IgG content

Le Cozler Y.^{1,2}, Guatteo R.^{2,5,6}, Le Dréan E.³, Turban H.³, Leboeuf F.⁴, Pecceu, K.⁴, Guinard-Flament J.^{1,2}



Corresponding author: yannick.lecozler@agrocampus-ouest.fr ¹



Colostrum and Immune Passive Transfer

Importance of colostrum intake → Energy & Immune Passive Transfer

Failure of passive transfer

- Increasing risk of Calf mortality, of Bovine Respiratory Disorders
- Decreased ADG, milk yield during in 1st lactation



► Rules of 3Q

Quality: based on IgG content:

IgG: at least 50 g/l

(mean IgG content, Holstein : 48 g/L (Pritchett et al., 1991))

Quickly

Within 2 hours after calving

(rate of **IgG transfer** optimal within 4 hours after calving)

Quantity

At least 2 litres

(intake **100-120 g IgG**, of a “standard” colostrum)

→ **quality dependant**





Colostrum and Immune Passive Transfer : Limits

Quality

Field methods: colostrometer, refractometer (good correlation if **proper use**)

A reference method : **Radial Immunio**Diffusion (RID), in laboratory

Limit : Influence of **sample** to be tested ?

Quarter sample vs **composite** sample

Time of sampling (first stream or whole milking)



Quickly and Quantity

Ideally, 2-4 Litres within 2-4 hours

Limit : Convince farmers (*ex.: calving occurring during the night ?*)

Need for further evidence of **gain when controlling quantity and interval** between calving and 1st intake





Objectives of the study

- 1- To investigate the influence of the **type of colostrum sample** on IgG assessment: **quarter vs composite sample**
- 2- To describe the **variation of colostrum IgG** content over time **during first milking**
- 3- To assess the **gain in terms of IgG content in calf sera when controlling the colostrum intake**

Experimental Farm (Mejusseume, INRA Rennes, France)

IgG assessment using RID

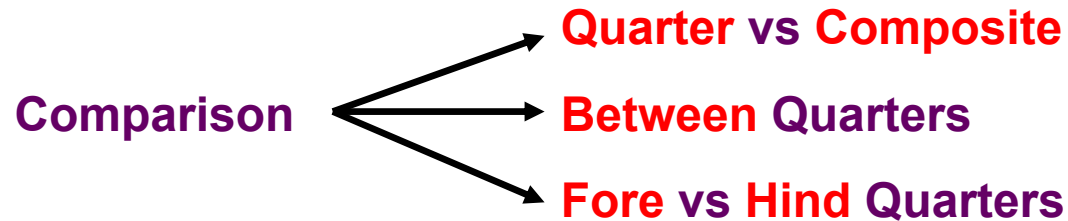


Material and methods

1. Influence of type of colostrum sample on IgG assessment

78 Holstein Dairy Cows

Quarter (10mL) and **composite** sample



2. Variation of IgG Content during 1st Milking

9 Holstein Dairy Cows

During **1st Milking**

Colostrum sample (10 mL) **every minutes**: 4-9 samples per cow

Description of **IgG content over time**





Material and methods

3. Gain in calf sera IgG when controlling colostrum intake

Calving season 2009 : 70 calves

No control of colostrum intake

2 x 2 litres offered bucket : spontaneous intake only

Calving season 2010 : 79 calves

Systematic control of colostrum intake

4 litres offered bucket : after 2h, if intake <2 Litres, then completed

Comparison of

Dam colostrum quality between 2009-2010

Calf sera IgG content (RID on sera collected 24-48h after birth)

Description of spontaneous colostrum intake (2010)





Results & Discussion

1. Influence of type of colostrum sample on IgG assessment

Quantitative results

Sample type	Mean IgG content (g/L)
Hind Right	56,7 ^a
Hind Left	55,9 ^a
Fore Right	54,6 ^{ab}
Fore Left	52,8 ^b
Composite sample	54.7



Differences between Quarters

Hind > Fore

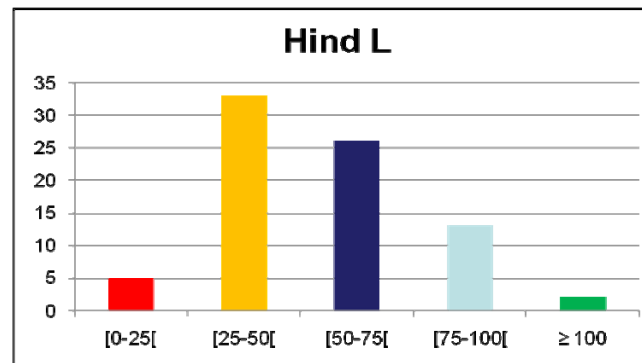
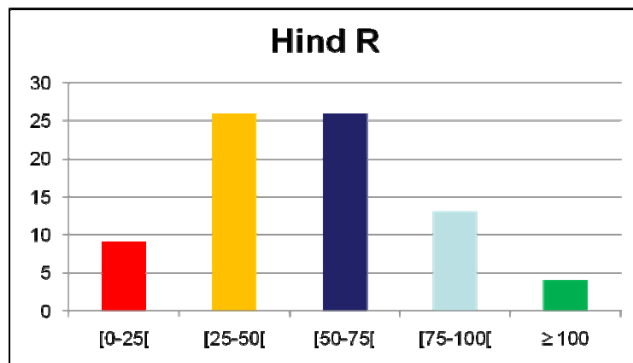
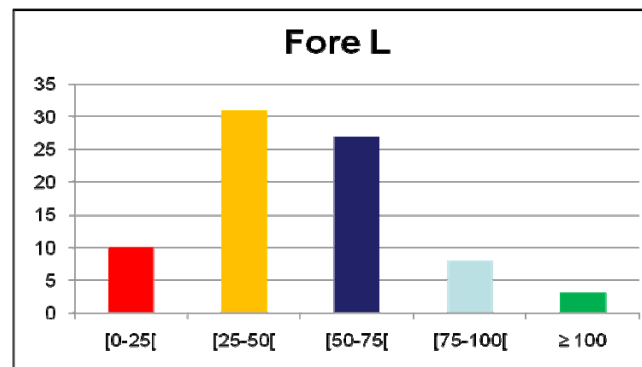
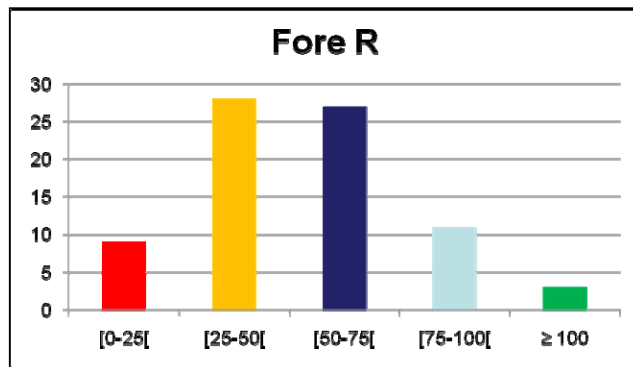
Hind Quarters > Composite > Fore Quarters

Impact for colostrum bank constitution ? But...

Results & Discussion

1. Influence of type of colostrum sample on IgG assessment

Qualitative results

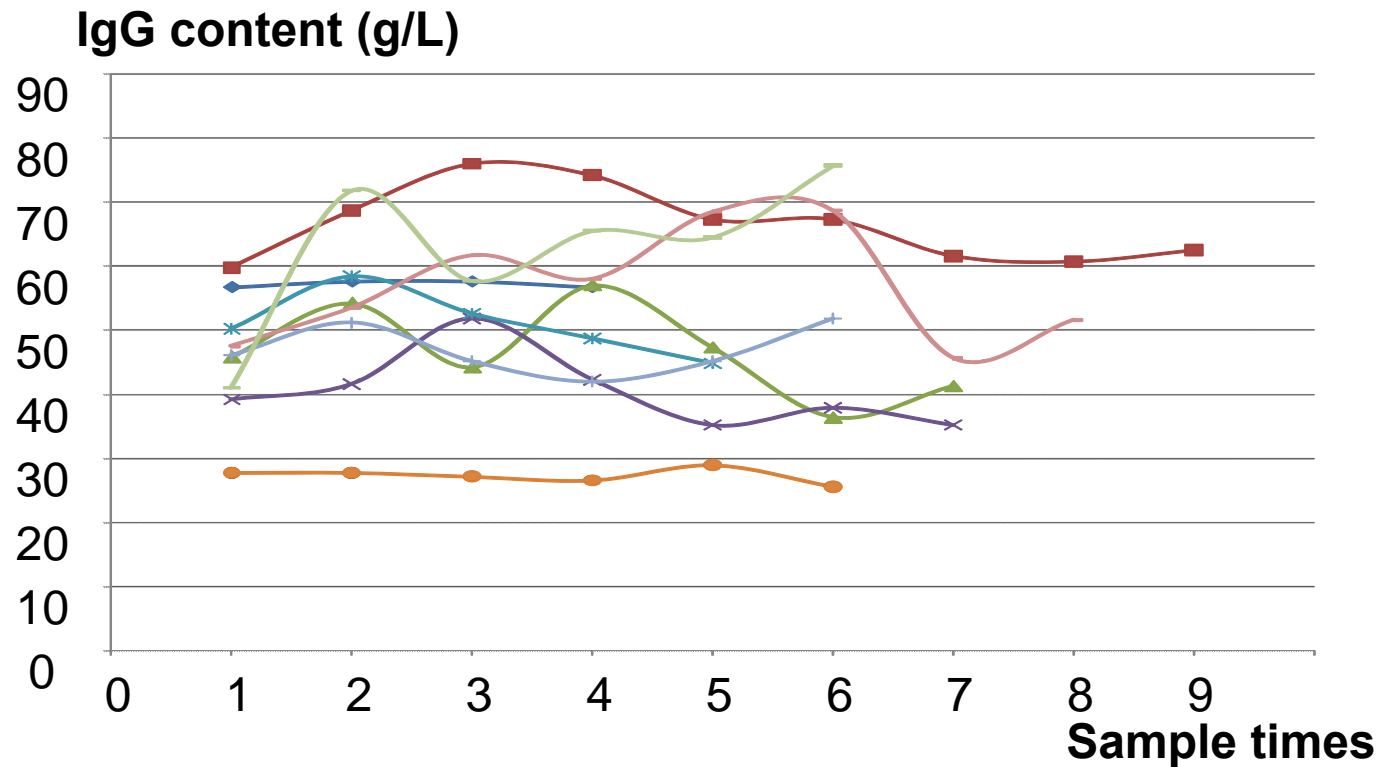


no discrepancy between:

- quarters
- quarters and composite sample

Results & Discussion

2. Variation of IgG Content during 1st Milking



- When **adjusting for the repeatability**: +/-15% for threshold of 50g/L
- No differences between sample times
- **Any or slight influence of sample time**

Results & Discussion

3. Gain in calf sera IgG when controlling colostrum intake

Dam colostrum composition similar between 2009-2010.

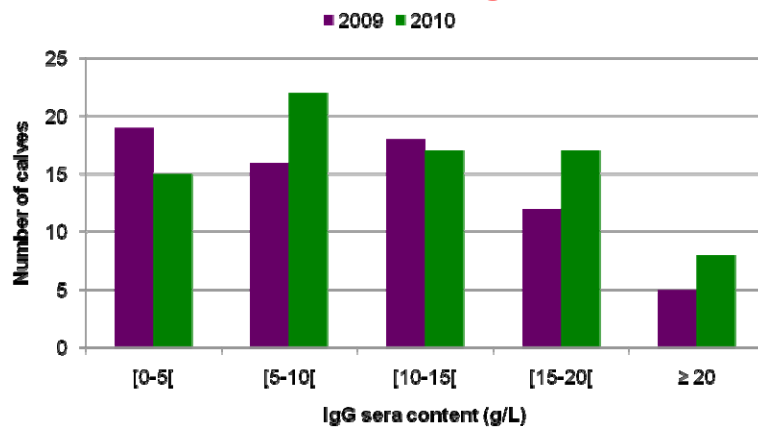


Then in calves ?

2009: more than half of animals: 1st intake of colostrum was too late (> 2 h)
 inadequate amount (< 2 l/animal)
 ...need for stimulation (2010 vs 2009)

Gain of such management ?

(4 litres offered bucket : after 2h, if intake <2 Litres, then completed)



2009 : Mean IgG sera content : 10.1 g/L
 Ration IgG calf/IgG colostrum : 19.4%

2010 : Mean IgG sera content : 12.5 g/L
 Ration IgG calf/IgG colostrum : 32.4%

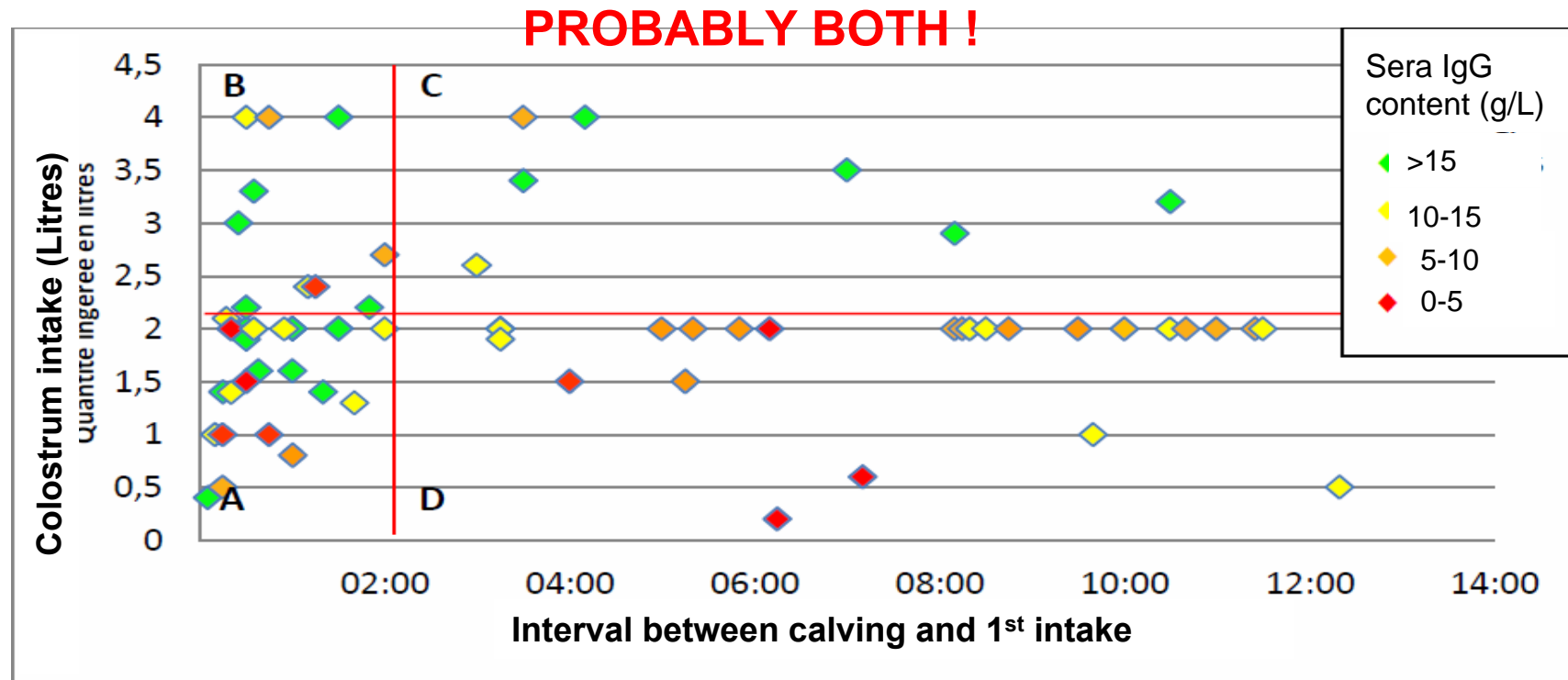
→
 Increase of % good quality colostrum

Gain : Quantity or Time of administration ?



Results & Discussion

3. Gain in calf sera IgG when controlling colostrum intake



Comparison

AB vs CD : Rate of “Adequate” Passive Transfer : 72 vs 45% → **Early Intake**

BC vs AD : Rate of “Adequate” Passive Transfer : 76 vs 50% → **Quantity Intake**

(? : check precisely IgG value in each sample)

Possibility to compensate late intake by increasing quantity



Conclusion : In Practice

Confirmation of the crucial role → Rules of 3Q

Quality

Assessment of IgG content in the colostrum: limited influence of sample type and/or sample time : **first stream of one quarter enough**

Quickly and Quantity

With a Dam colostrum **[40-50] g/L IgG**

With a **spontaneous** intake of **at least 2 Litres**

Within 2 hours after calving

If spontaneous intake <2L at 6 hours: then complete



Thank you ...