

# Effects a of reduced day milking interval on dairy cows performances and labour costs

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**Is it really necessary to milk the  
cows every 12 hours?**

# WORKING CONDITIONS ON FARMS: A CHALLENGE FOR THE DAIRY CHAIN

- Milking = 50% of the daily compulsory work
  - Usually takes place morning and evening, 365 days per year
- New demands of breeders and of their families:
  - Free time, flexibility
  - Hinders young farmers to settle
- Farms are getting bigger → number of salaried workers increases
  - Hard to find paid labour → working times are little attractive
- **Attractiveness of the jobs: both for breeders and salaried workers**
- **Stay in good health!**



# A diversity of solutions to improve flexibility

## Prevent milking from being considered as a "load"

Several ways are possible, to adapt to background and targets of the farmer

Delegate

Several  
milkers

Number  
of  
milkings

Arrange  
work's  
schedule

Robots

Milking  
equipments

Ergonomy

# Decrease the number of milkings per week



- **Stop milking on Sunday evenings:** 1/2 day off



Milk decrease -5%, increase in solids  
Impact on cell counts on Mon and Tues  
*If possible, limit interval to 21h*



Trials: Derval KTC 2000/2002

- **3 milkings in 2 days:** office work schedule 1 day/2



A temporary solution because of staggered hours  
(ex: 5am-9pm then 1pm)  
Less walking for cows (NZ)



# Decrease the number of milkings per week



- **OAD milking, all or part of the year**

Labour: -20%, all evenings free



- Milk decrease by 25%, higher solids
- Strong improvement of body condition and reproduction
- Only possible with a low cell count starting point and very low cost diet
- Trials made in Blanche-Maison (2005) and Trinottières KTCs (2003) during 2 months
- Trials made in Trévarez KTC on complete lactations (4 years) 2001-2004

**All these technics are reversible and need no investment**

# Another possible solution: change milking times and intervals

- What are the impacts of a milking interval (MI) of 6h30 min between morning and evening milkings?



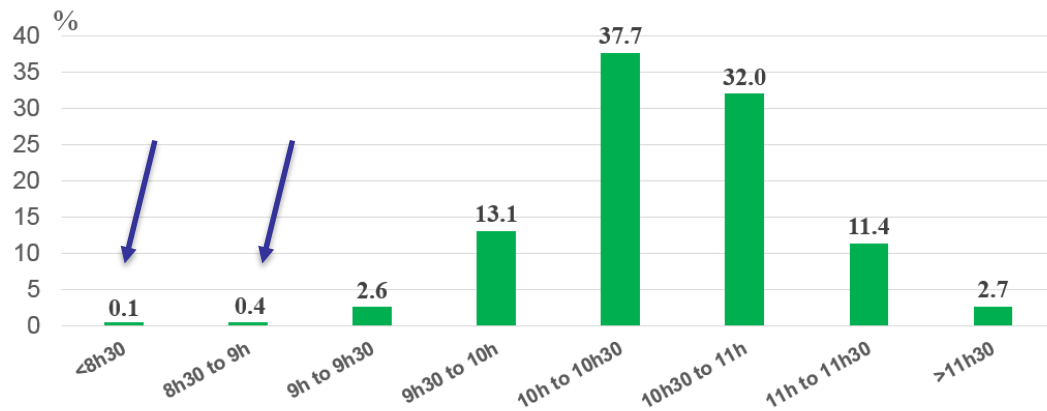
- Milking Interval: time between *cups in* on 1<sup>st</sup> cow at morning milking / *cup in* on 1<sup>st</sup> cow at evening milking

# In Brittany, the average day MI is 10 hours 23 minutes

Table 1: Milking practices (on the official control days)

Milk performance control bodies	EYLIPS and BCLEO (France)
<b>Number of farms</b>	<b>5,844</b>
<b>Average milking times</b> morning / evening	<b>7 : 25 am / 5 : 45 pm</b>
<b>Milking interval</b> Average morning-evening	<b>10 h 23 min</b>
Between 10 and 11 hours	<b>69.7%</b>
Below or equal to 9 hours	<b>1.2% (68 farms)</b>

Figure 1: Distribution of milking intervals between morning and evening milking (%).



Study made by Agrocampus Ouest, BCEL Ouest and Eilyps data (5,844 farms, see Brocard EAAP 2015).

- The weight of **habits**
- Breeders fear for health and welfare of cows



# New experiments for more publicity

- Trials made by INRA Clermont-Ferrand (Rémond et al, 2006)
  - **over 7h of MI: no impact on dairy performances**
- Why renew these trials?
  - Local references on a high producing herd, maize based diet
  - Test a new interval of **6h30 minutes** to fit with an *office* schedule of 8 hours
- **Which impacts of a shorter MI on cows performances and behaviour?**
- **Which economic impacts for breeder?**

# Protocol of the experiments

- Trévarez experimental Farm, Western France
- 2 winters, 4 months experiment each winter
- Holstein cows > 9,000 kg milk per year
  - Two groups 16 cows, early or mid-lactation
- TMR (maize silage + soya+ production concentrate) fed indoor

## Milking times:

### Pre experiment

	<b>10H group</b>	<b>6h30 group</b>
<b>Morning milking time</b>	7 am	7:40 am
<b>Evening milking time</b>	4 pm	4:40 pm
<b>DAY interval</b>	9H	9H
<b>NIGHT interval</b>	15H	15H

### Experiment

	<b>10H group</b>	<b>6h30 group</b>
<b>Morning milking time</b>	7 am	9 am
<b>Evening milking time</b>	5 pm	3:30 pm
<b>DAY interval</b>	<b>10H</b>	<b>6H30</b>
<b>NIGHT interval</b>	14H	17H30

# Material and Methods

**Milk**

Each  
milking

**Fat and true  
Protein contents**  
4 times per week

**Cell  
Counts**

## Analyses:

- By milking (Morning vs Evening)
- By 24h period
- By month (Month 1, M2, M3)
- Over the whole experimental period

**Impacts:  
at day and  
milking  
levels**

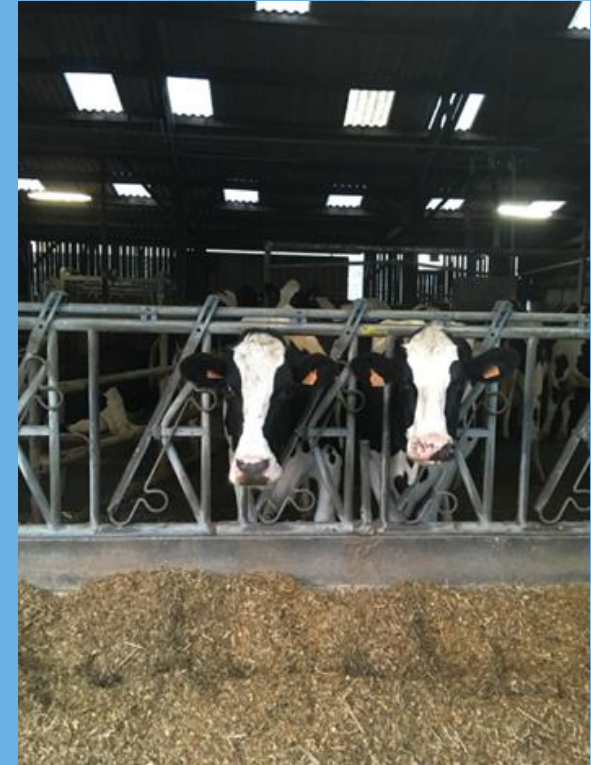
*Example of ANOVA model:*

Dairy production = f (year, parity, group, pre-experimental production, stage of lactation, interactions)

CCS → log

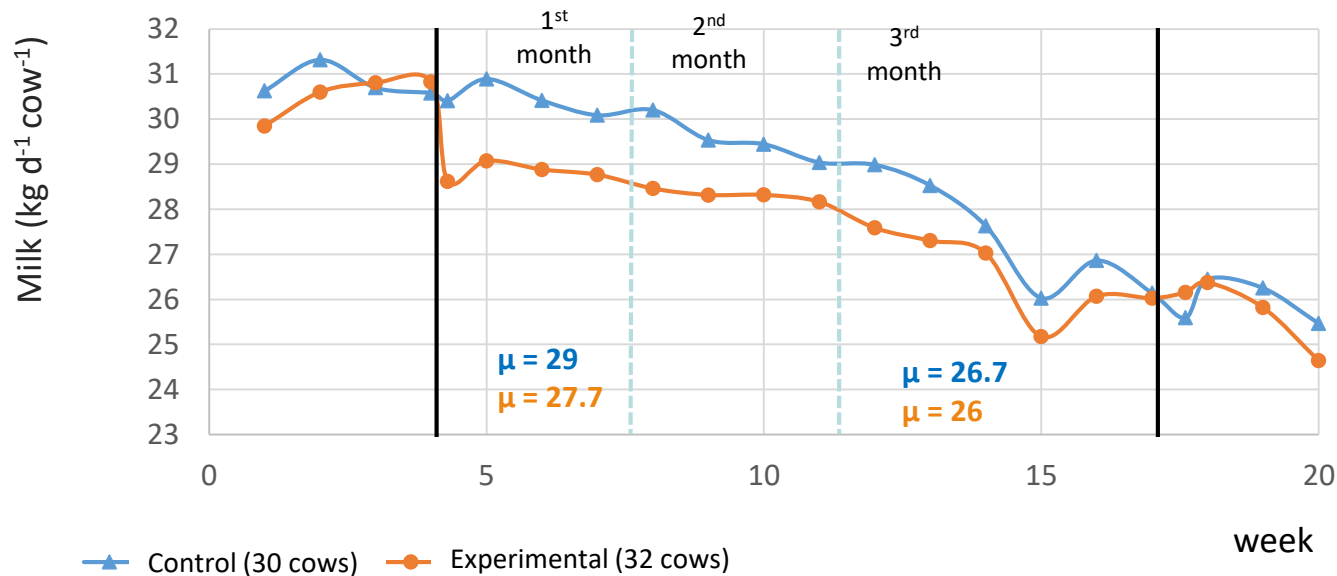
# Methods: Health and behaviour

- Intake (whole group average)
- **Feeding behaviour: time recording of cows lying / at trough / other location**
- Weight and body condition score: pre and post experiment
- Recording of all health disorders



# A slight decrease in production but a quick adaptation of cows

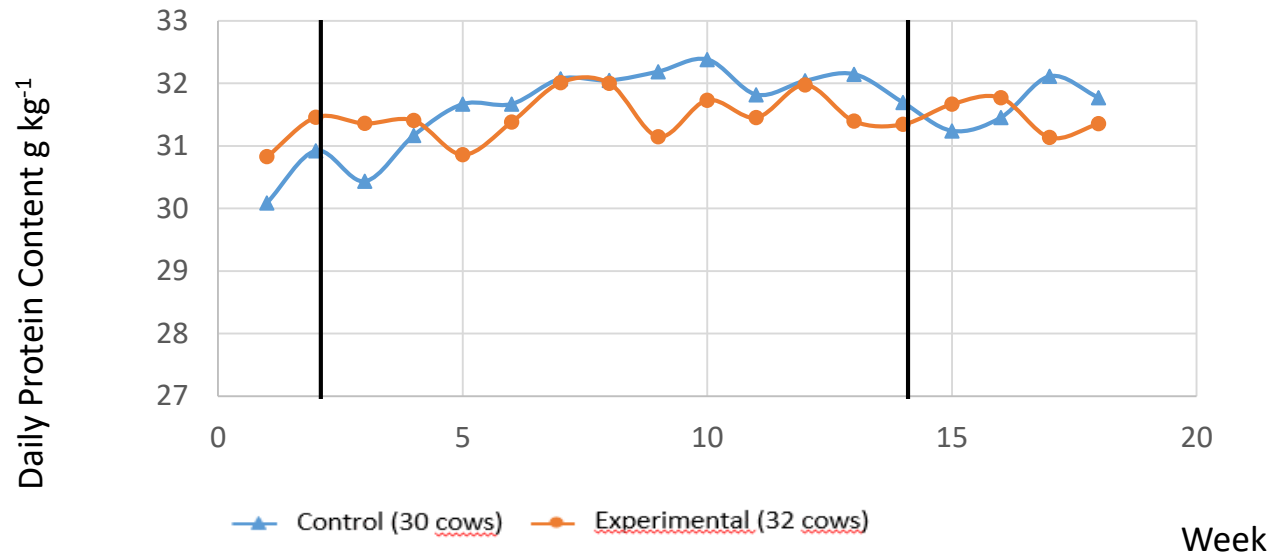
Evolution of DAILY dairy production (two years average)



- Stat significant decrease by -1.3 kg of milk during the 1<sup>st</sup> month
  - Effect of MI non significant during 2<sup>nd</sup> and 3<sup>rd</sup> months
  - The effect of MI did not differ according to lactation stage
- **The cows adapt to this husbandry practice**

# At day level: decrease in Protein Content but no impact on Fat Content

Evolution of day protein content (2 yrs average)

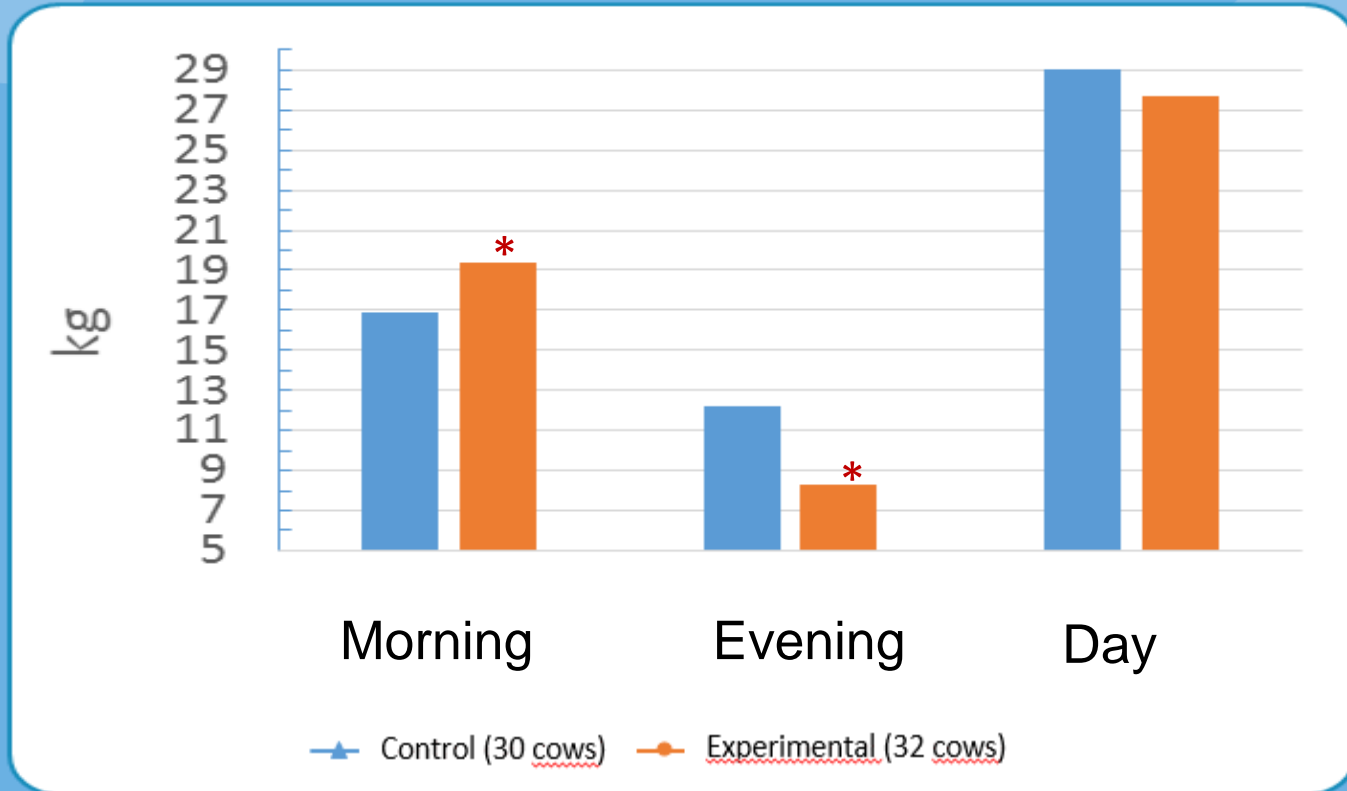


## For the milk of the DAY:

- -0.1 % PC (-1 g/kg)
- No significant effect of MI on day Fat Content

# A greater impact on **evening milk**

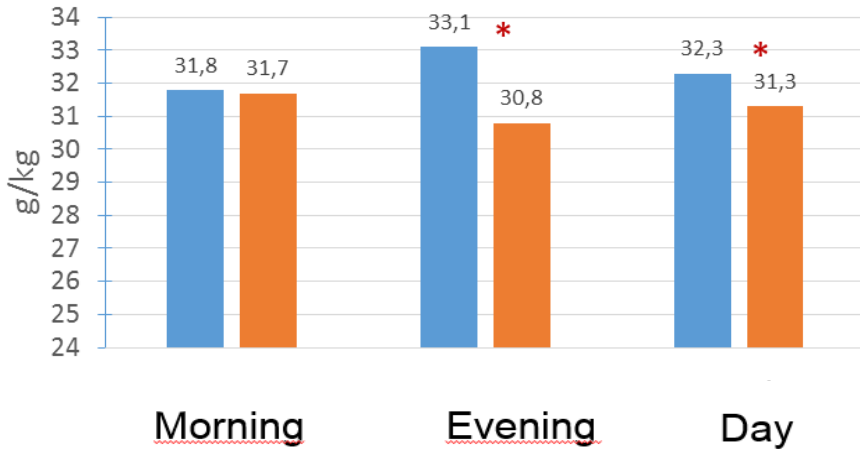
Adjusted means for milk (total experimental period)



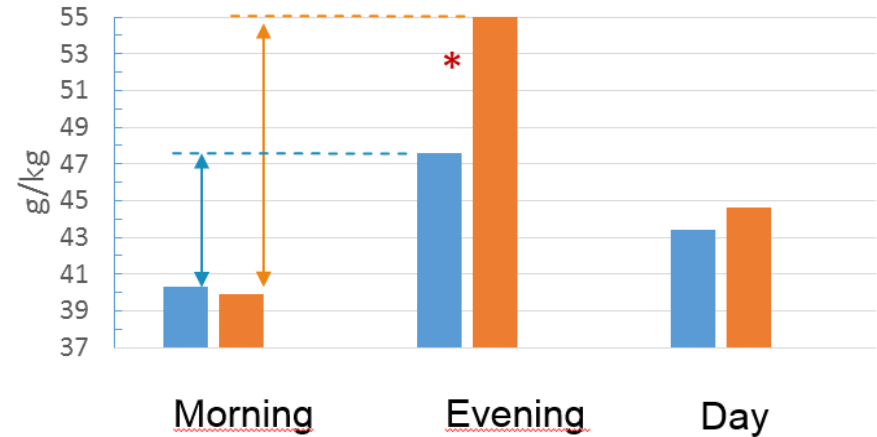
**+ 2.8 kg milk in the morning ; -3.7 kg in the evening**

# A greater impact during EVENING milking

Adjusted means for Protein Content



Adjusted means for Fat Content



— Control (30 cows) — Experimental (32 cows)

\* significant differences at p=5%

- Evening milk: -2.7 g/kg ; +9.2 g/kg FC
- No significant effect of MI on morning milk features
- **Differences in Fat Content between morning and evening milks increased**



# No impact on health and cows behaviour

- **No visible effect on:**

- Total intake of dry matter
- Weight
- Body condition scores
- Recorded health disorders (incl. Mastites)
- Cows behaviour → cows eat after milking (TMR delivered during morning milking)

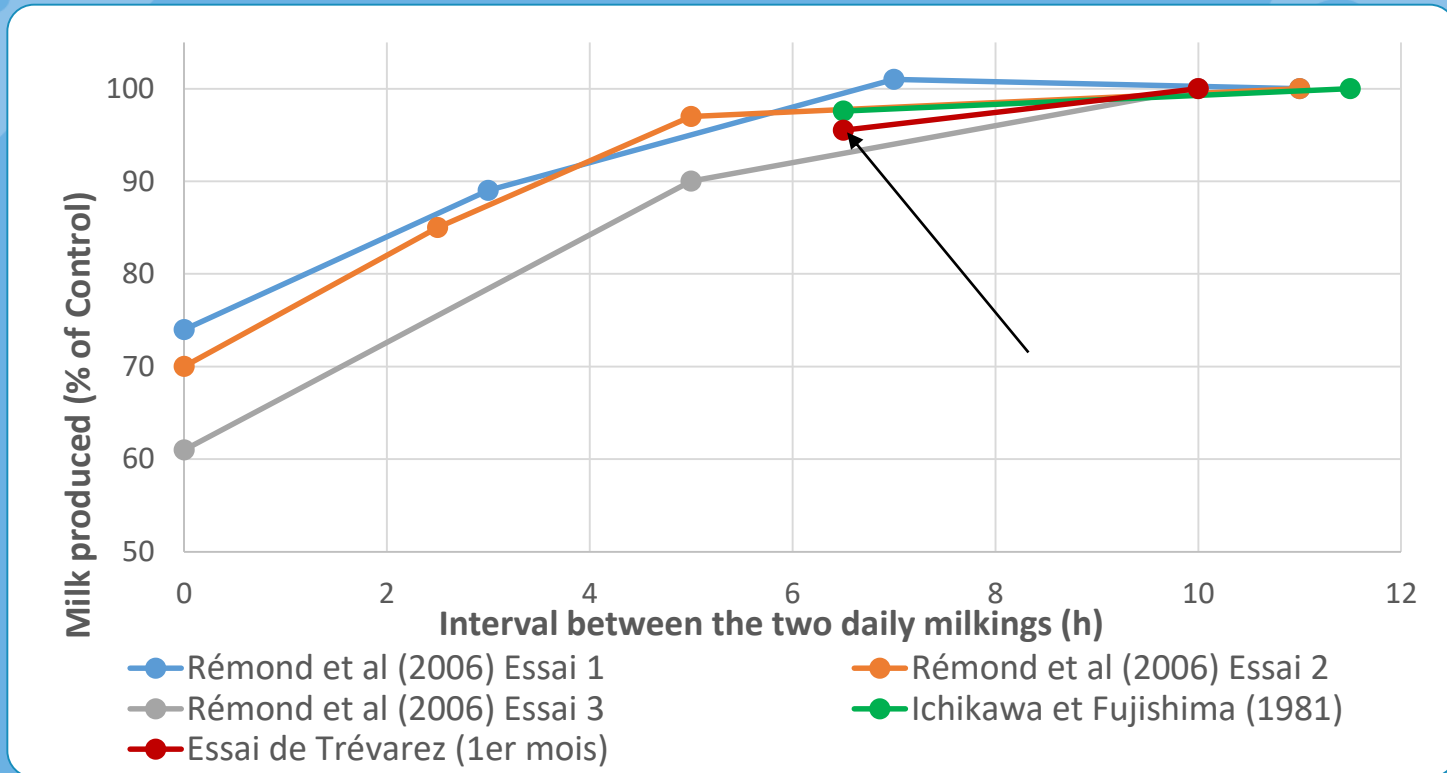


- **No significant effect of MI on cell counts**

**No impact of MI on health and behaviour**

# Discussion: milk loss consistent with literature

Daily dairy production according to day milking interval  
(expressed as % of milk produced by control group)



It's the NIGHT interval which is longer, that penalizes dairy production → negative retrocontrol (Knight et al, 1998 ; Stelwagen, 2001)

# Summary of the technical impacts

- -4.5 % of milk during 1<sup>st</sup> month, then cows adapt
- - 0.1 % Protein Content; no effect on Fat Content
- No impact on health, on udder health and behaviour
- No necessary change in husbandry practices except milk feeding of calves in the evening (Fat content of raw milk very high, reduce volume by 1 L)

# The economic balance depends on the farmer's choice

- For this assesment, only stat significant effects are included
- *Case study:*
  - Farm delivering 400,000 L of milk per year
  - Average milk price 330 € per 1000 L
  - 1 g/kg Protein Content paid 6.6 € per 1000 L
- - 4.5 % milk the 1<sup>st</sup> month → - 1,500 L milk = - **495 € the 1<sup>st</sup> month of application**
- - 0.1 % PC → - **2,640 € per year**

**The economic loss can reach 2,640 € per year in a routine year BUT it can be fully compensated by an economy on extra working hours paid to workers (over 35 h per week)**

# Proposed working time for a salaried worker (milking interval of 6h 30 min)

	Possible schedule
Employee arrives at	9 am
Starts milking cow #1 at	<b>9:30 am</b>
End of milking and cleaning	11 am
Lunch break	1 pm – 2 pm
Starts milking cow #1 at	<b>4 pm</b>
Leaves farm at	5:30 pm
Was on farm during	8h 30 min
<b>Total working time per day</b>	<b>7h 30 min</b>
Extra hours to be paid per week (law = 35h)	2h 30 min

# Conclusion and prospects

## It's up to the farmer to choose:

- More flexibility but economic loss
- If he employs a worker → neutral economic impact and easier to find/keep workers

## A large range of milking intervals are possible

- With a milking interval of 7 or 8 hours → no impact on performances (Rémond et al, 2006)



## In practice:

- These technics are reversible and need no investment: accessible to all!
- It is possible to decrease MI down to 7 hours with NO impact on production
- Below 7 hours, cows adapt within 3 weeks.
- No impact on husbandry (except necessary reduction of milk given to calves in the evening)
  - A slight economic loss but much more flexibility
  - Can be compensated if salaried worker on farm
  - New working times, more attractive and compatible with family life or other responsibilities



# Thanks for your attention!



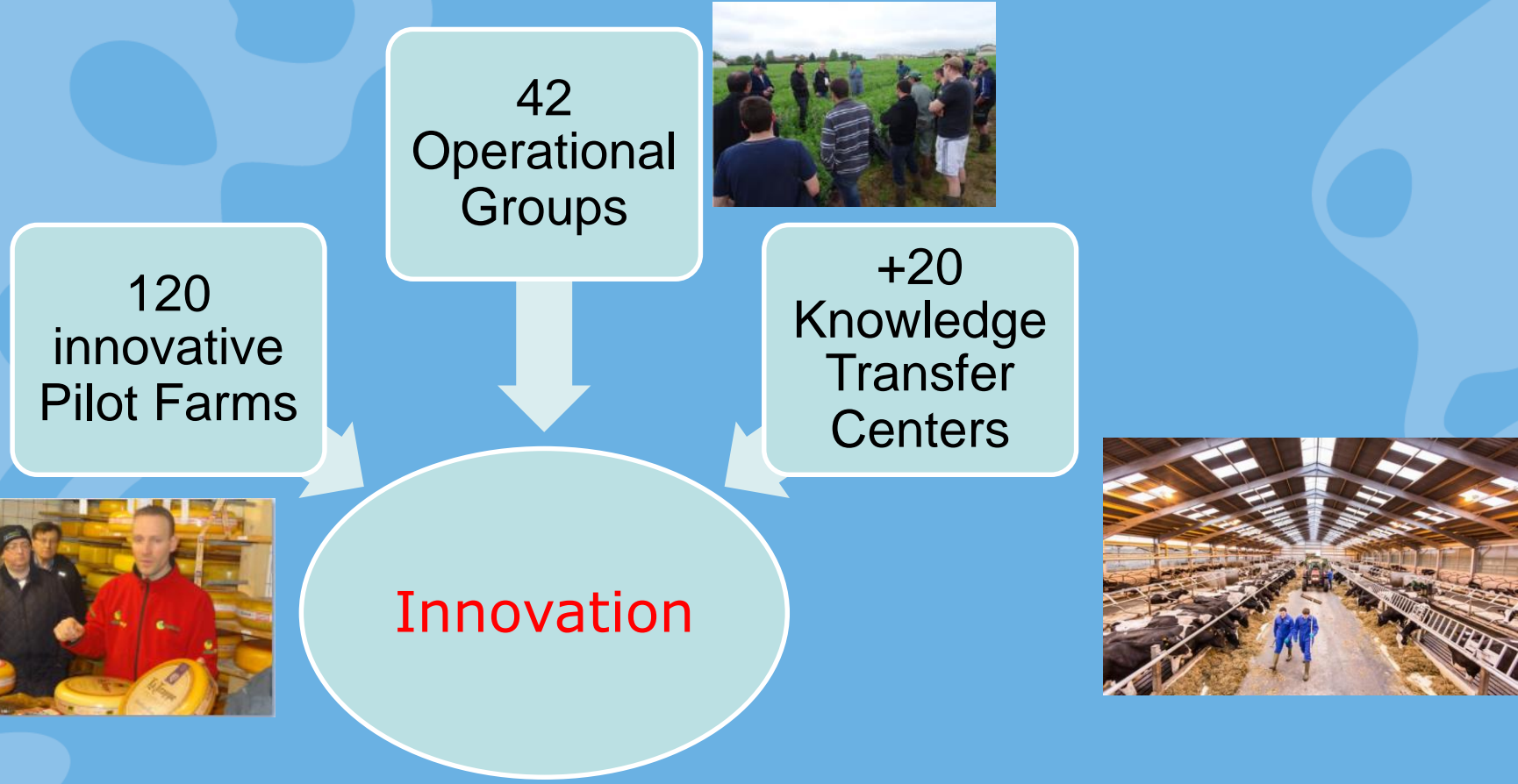
<http://www.web-agri.fr>

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# Eurodairy: Sharing experience to face challenges



4 main topics:



Resource Efficiency



Animal Care



Socio-Economics



Biodiversity

[www.eurodairy.eu](http://www.eurodairy.eu)