

Belgische Confederatie van de Zuivelindustrie



Confédération Belge de l'Industrie Laitière

# Reuse of water in dairy industry: the Belgian approach

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# Outline

- Legislative framework
- Definition of potable water
- Procedure for exemptions
- Current exemption dairy industry
- Future



# Legislative framework

- Directive 98/83/EG on the quality of water intended for human consumption
  - Royal Decree of the 14th of January 2002 on water
- Regulation (EC) N° 852/2004 on the hygiene of foodstuffs
- Royal Decree of the 14th of November 2003 on self checking



# Definitions

- Potable water: water that meets microbiological, chemical and physical requirements as laid down in Royal Decree of 2002.
  - > recycled/reused water can possibly fulfill these requirements, in that case it is considered 'potable water'



# Minimum requirements potable water

- Royal Decree of 2002 (Directive 98/83/EG)
  - free from any micro-organisms and parasites and from any substances which, in numbers or concentrations, constitute a potential danger to human health
  - Meet minimal requirements part I and II of annex (corresponds to parts A and B of Annex I of Directive)
    - Microbiological parameters
    - Chemical parameters



# Exemptions

- According to
  - Regulation (EG) nr. 852/2004 (annex II, chapter VII, point 3)
  - Royal Decree of 2002 (art 2)
- Recycled water used in processing or as an ingredient is to be of the same standard as potable water, unless the competent authority is satisfied that the quality of the water cannot affect the wholesomeness of the foodstuff in its finished form.



# Procedure request exemption

- Circular Federal Agency for the Food Safety of the Food Chain (FASFC)
  - Explains procedure to request exemption
- Wholesomeness and safety of the food must be substantiated
- Request from a sector with technical dossier
- Competent authorities investigate the request
- If accepted:
  - integration in the 'self checking guide' of the sector
  - Integration in the 'self checking systems' of the companies



# Procedure request exemption

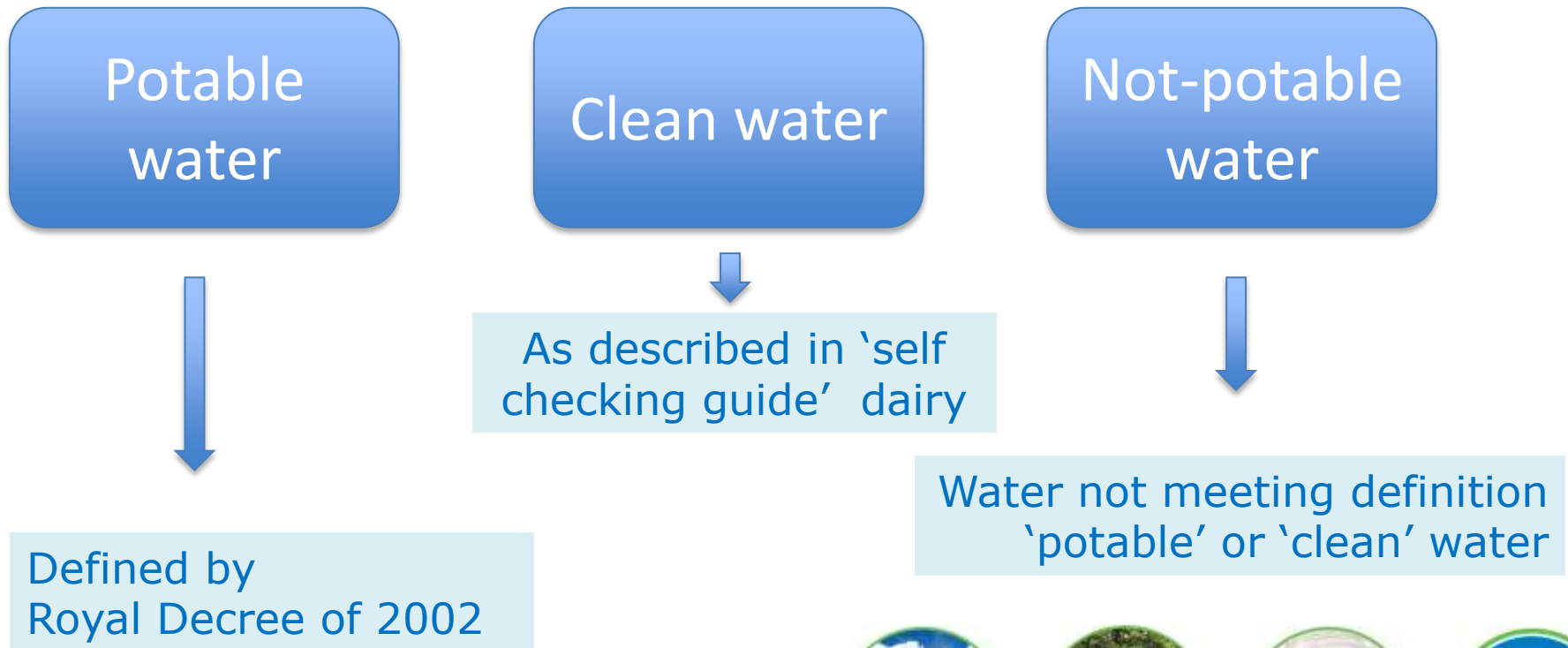
- Request from a sector: technical dossier
  - Properties of the water (origin, risk analysis, risk management)
  - Result of analyses (up to 3 year)
  - Treatments of the water
  - Description production process
  - Material of pipes





# Current situation Dairy sector

## Types of water



# Sources of clean water

Clean water

Process water

Product water

Reconditioned  
water

-f.ex. last water used for  
rinsing after CIP  
--mostly no  
reconditioning

-f.ex. Permeate after  
reverse osmose  
-F.ex. Condenswater

-Different origins  
possible :  
groundwater,  
rainwater, ...



# Reconditioning of water



- Different techniques can be used
- Technique must be validated
- Continuous follow up
- Monitoring water quality



# Requirements clean water

PHYSICAL: Free from physical particles

Process water

MICROBIOLOGICAL

-total cell count (22°C):

<100 cfu /ml

-*Enterobacteriaceae*:

<1 cfu/ml

Product water

MICROBIOLOGICAL

-total cell count (37°C):

Indicator <50 000 cfu /ml

-*Enterobacteriaceae*:

Indicator <100 cfu/ml

-*Pseudomonas aeruginosa*

Indicator 0/250 ml

-*Bacillus cereus*

Indicator < 10cfu/ml; max

1000 cfu/ml

-*Salmonella* spp:

Indicator: absent in 25 ml

Reconditioned  
water

MICROBIOLOGICAL

-total cell count (37°C):

Indicator <50 000 cfu /ml

-*Enterobacteriaceae*:

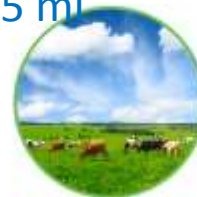
Indicator <100 cfu/ml

-*Pseudomonas aeruginosa*

Indicator 0/250 ml

-*Clostridium perfringens* (if  
surface water):

indicator: 0cfu /100 ml



# Requirements clean water

PHYSICAL: Free from physical particles

Process water

Product water

Reconditioned  
water

## CHEMICAL

-no residues cleaning or disinfection agents

## CHEMICAL

Monitoring parameters of Royal Decree, except

- Color
- Conductivity
- pH
- Odour
- Taste
- turbidity

## CHEMICAL

Monitoring parameters of Royal Decree

+

All parameters of Royal Decree



# Frequencies analyses clean water

Process water

-minimal monthly

Product water

-microbiological parameters  
\**Enterobacteriaceae* and *B. cereus*: monthly (intern lab)  
\*by extern lab based on volume (RD 2002)  
-chemical parameters:  
Min once a year + based on volume (RD 2002)

Reconditioned water

-microbiological parameters  
\**Enterobacteriaceae* and *B. cereus*: monthly (intern lab)  
\*by extern lab based on volume (RD 2002)  
-chemical parameters:  
Min once a year + based on volume (RD 2002)



# Procedure high degree of contamination

- If analysis reveals that degree of contamination > authorized values
- Valid for both potable water and clean water
- Set up of investigation cause
- Set up remedial measures asap
- Risk analysis to determine whether food safety issue for products/water  
(meanwhile products are considered non-conform)
- Only restart use of water if proven quality
- All documentation should be kept



# Use of clean water

- production of steam (if no components move from the steam to the product that pose a health concern)
- cleaning of floors/walls/production-environment if production process is closed (no direct contact with product)
- if sufficient heating of product/equipment:
  - Start up production processes
  - Rinsing (short CIP) of machines,...
  - Removal product at end of production process





# Use of clean water

If there is potentially contact of the clean water with the product, heat treatment is necessary

- Microbial criteria of product need to be guaranteed
- Heat treatment is described in HACCP of company
- Heat treatment is validated and verified by sampling and analysis



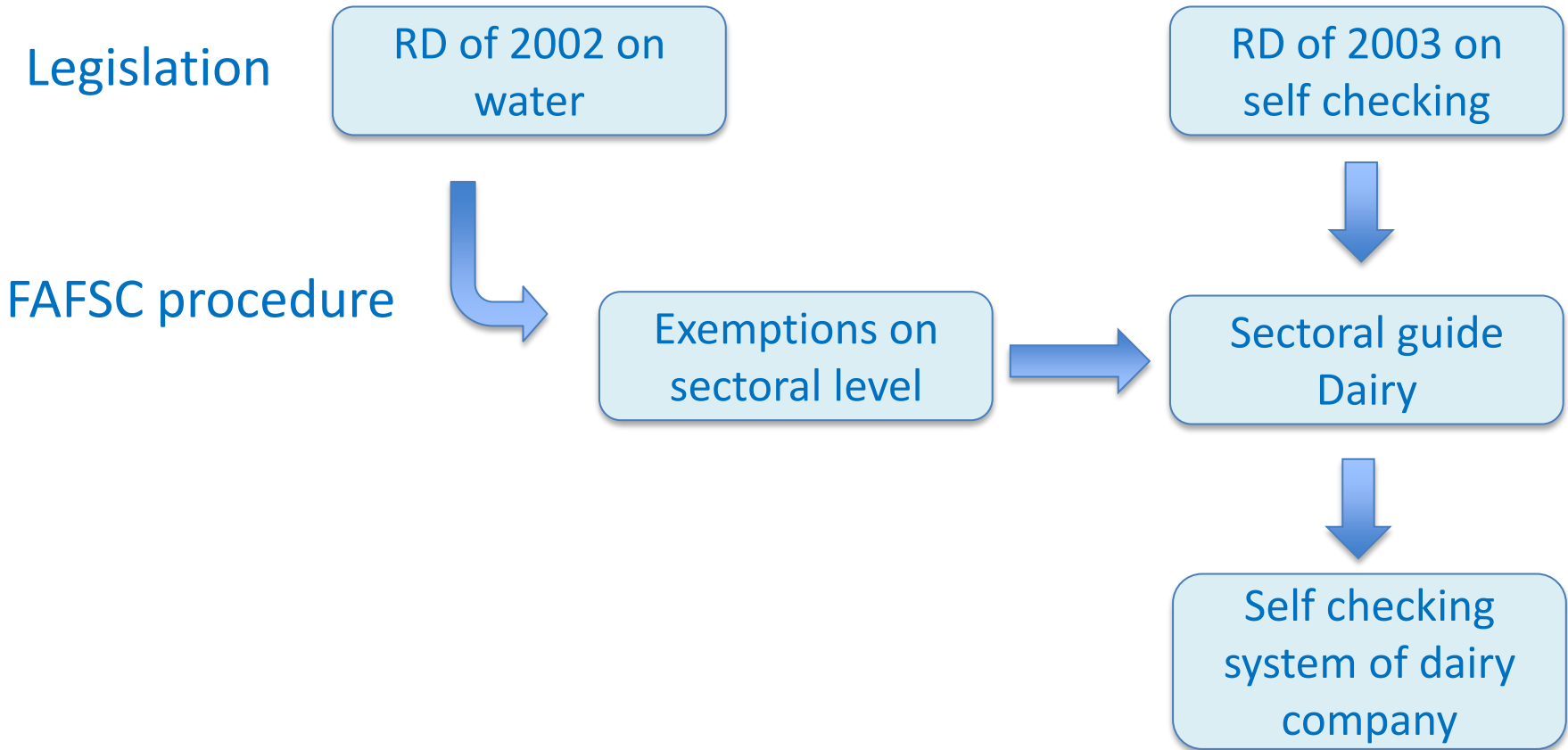
# Clean water in pipes

If clean water is used, separate pipes need to be present for the clean water (different color, label,...)

Pipes for clean water can not be connected to pipes for drinking water



# Overview proces exemptions



# Future?

Further reconditioning of clean water to 'potable water'?



# Future?

Product water (f.ex. Permeate after reverse osmosis)

- Compliance with all parameters of Royal Decree?
- If not, which parameters are not met?
  - Does this pose a risk for public health?
- Point of attention: if  $\text{ClO}_2$  treatment: does this generate chlorinated protein compounds?
  - > to be verified!



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# Thank you for your attention!

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