

Session 11 Abstract 3685
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Economic Assessment of Selective Versus Blanket Dry Cow Treatment

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Context and objectives

French context

Systematic antibiotic dry-cow treatment = widely implemented,
but has become challenged
No clear indications for selective implementation available
Availability, but low use of the inert teat sealer

Prescriptor needs

What option for a given herd and which decision rules for individual cows

Study objective

To provide guidelines from simulations performing a comparative assessment of strategies and decision rules for dry-cow treatment:

- blanket AB; blanket AB+SEAL
- selective AB
- selective combinations AB_{el}seSEAL and AB+SEAL
- complete interruption of dry-cow treatment

Context and objectives

In these 10 minuts

Only a part of the research undertaken

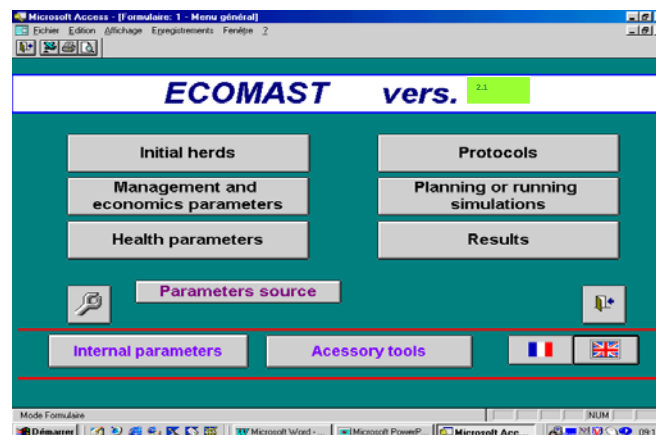
- “Average/mixed prevalence” of bacterial pathogens at drying-off
- “Environmental risk” for new infections during dry period

Preliminary results not developed

- No large effect of herd size (▶ 50-cow herd)
- Quite small economic differences (▶ 4-year horizon)
- Overall : preference to a sensitive rule to choose the cows receiving AB under selective treatment
(cost of 1 false negative > cost of 1 false positive)

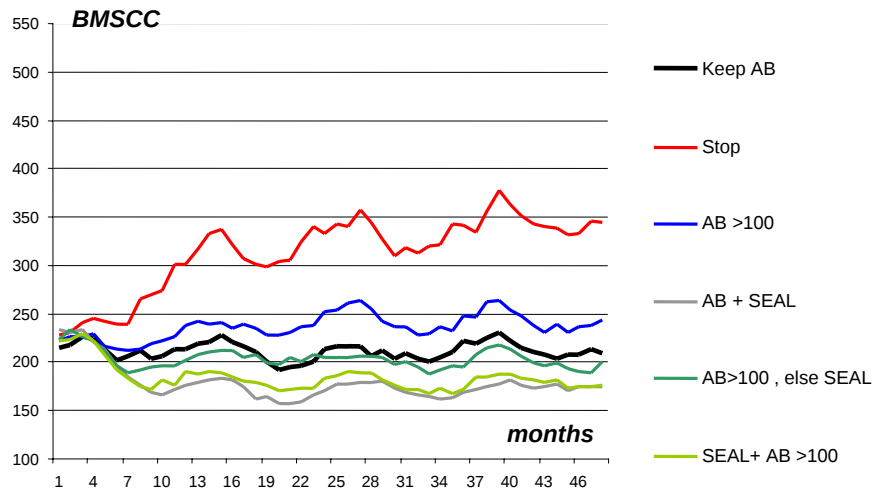
Material and methods

Dynamic stochastic Individual-based simulation model



Material and methods

Simulation principle



Material and methods

Utility function

Economics

Reduction of AB treatment costs

low impact: 200-300 € /an for a 50-cow herd (max = -2/3)

Increase of treatment costs due to sealer use

limited impact: 350-400 € /an for a 50-cow herd

Negative economic consequences

- no cure of some existing infections
- more new infection cases
- more secondary cases

uncertain impact depending on prevalence and risk (levels and aetiological profiles)

Material and methods

Utility function (followed)

But not only ...

1. Rejection from milk collection (BMSCC >400 000)
2. 4-year cumulated gross margin (5% discounted; 1500 €)
3. Relative variation in AB treatments / 100 cows (25%)
4. Absolute variation in clinical cases incidence (10 cases / 100 year-present cows)

French 50-cow herd

- strict milk-delivery quatum of 400 000 L
- implementing blanket AB dry-cow therapy for at least 4 years

Material and methods

Strategies and tested rules

Keep on blanket AB REFERENCE SCENARIO

Stop = no longer AB

AB > 100 000 (and AB > 150 000 ; AB > 200 000)

Sealer + AB systematically

AB >100 000, else sealer (and AB > 150 000 ; AB > 200 000)

Sealer + AB >100 000 (and AB > 150 000 ; AB > 200 000)

Explored epidemiological contexts

Prevalence at drying-off

Risk for NI in dry period

BMSCC = 300 000

30 % 15 %

BMSCC = 215 000

30 % 15%

BMSCC = 160 000

15 % 7%

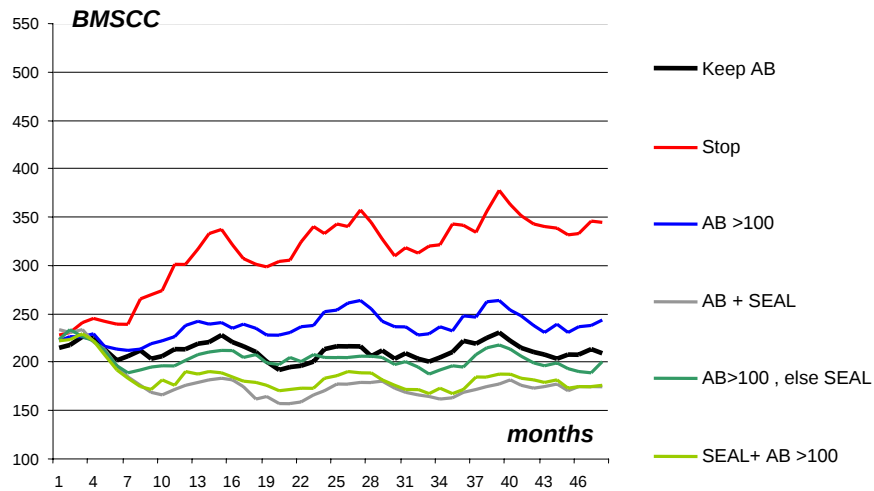
Results

Prevalence at drying-off

BMSCC = 215 000

Risk for NI in dry period

15 %



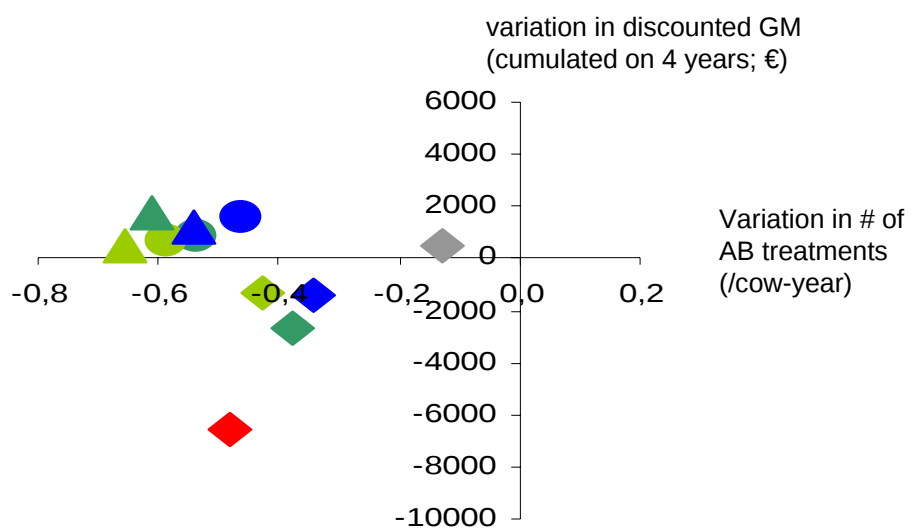
Results

Prevalence at drying-off

BMSCC = 215 000

Risk for NI in dry period

15 %



Results

Prevalence at drying-off

BMSCC = 215 000

Risk for NI in dry period

15 %

Treatment option	GM variation cumulated on 4 years (€)	Variation in clinical incidence (/cow-year)	Variation in AB treatments (/cow-year)
Keep AB syst.	Reference	Reference	Reference
Stop	-6601	0.31	-0.48
Sel AB>100	-1384	0.09	-0.34
Sel AB >150	-2658	0.10	-0.38
Sel AB>200	-1344	0.10	-0.43
Syst AB + SEAL	453	-0.13	-0.13
Sel AB>100, else SEAL	1544	-0.04	-0.46
Sel AB>150, else SEAL	833	-0.05	-0.54
Sel AB>200, else SEAL	697	-0.05	-0.59
SEAL+ Sel AB >100	1199	-0.13	-0.54
SEAL+ Sel AB >150	1747	-0.12	-0.61
SEAL+ Sel AB >200	522	-0.12	-0.66

Results

Prevalence at drying-off

BMSCC = 300 000

► **BMSCC = 215 000**

BMSCC = 160 000

Risk for NI in dry period

30 % 15 %

30 % **15%**

15 % 7%

Keep on AB treatment ...

Selective AB: to be avoided, or to combine with sealer use!

Preference to options as:

selective AB >100 000 (or 150 000), else sealer application

systematic sealer application + selective AB >100 000 (or 150 000)

Results

Prevalence at drying-off

Risk for NI in dry period

BMSCC = 300 000

30 % **15 %**

BMSCC = 215 000

30 % 15%

BMSCC = 160 000

15 % 7%

Positive impact on GM of all options using sealer
(+ 3200 to 4900 € cumulated on 4 years)

Selective AB: to be absolutely avoided (negative impact on GM),
or to combine with sealer use!

Preference to options as:
selective AB >100 000 (or 150 000), else sealer application
systematic sealer application + selective AB >100 000 (or 150 000)

Results

Prevalence at drying-off

Risk for NI in dry period

BMSCC = 300 000

30 % 15 %

BMSCC = 215 000

30 % 15%

BMSCC = 160 000

15 % 7%

No significant impact on GM
(complete interruption : -1000€)

Selective AB: can be implemented
but with a small increase in clinical cases (avoided when
combined with sealer use)

Preference to options as:
selective AB >150 000 (or 200 000), else sealer application
systematic sealer application + selective AB >150 000 (or 200 000)

Results

Prevalence at drying-off

BMSCC = 300 000

BMSCC = 215 000

BMSCC = 160 000

Risk for NI in dry period

30 % 15 %

30 % 15%

15 % **7%**

No significant impact on GM

Complete interruption of AB use: possible

Discussion & conclusion

Selective AB treatment without sealer use is relevant in low prevalence and limited risk contexts

Update of strategy needed every 6 months

Options including teat sealer use are relevant in the environmental risk contexts

Not only, (not shown here)

Limited positive economic effects over 4 years

From nothing to 5000 € on 4 x100 000 € gross margin

However they directly impact the profit...

Discussion & conclusion

Partial results

Other types of epidemiological contexts...

Average results

Variability in outcomes... vs. risk aversion...

Farm specific assessment...

Prevalence at drying-off can be known and quite easily
characterized

Predictive risk assessment for new infections is less easy...