How does NTM work in practice

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Different ways to show that NTM works in practice!

Danish results

All herds

OR

Best herds

Average herds

Worst herds

All herds

Analysis within herd

Half with Lowest pedigree NTM

Half with Highest pedigree NTM

Difference in high or low group for yield, fertility, health, ect.

All herds

- Heifers born 2009-2010
- Only herds with more than 100 cows
- Edited data from genetic evaluation

Results for yield

Half with H NTM compared to half with L NTM			
Breed	RDC	HOL	JER
Number of herds	79	948	171
Yield index difference H vs L	6	7	6
305-day F+P (kg) – 1. lact.	+26	+24	+26
305-day F+P (kg) – 2. lact.	+38	+36	+40

Results for reproduction

Half with H NTM compared to half with L NTM			
Breed	RDC	HOL	JER
Fertility index difference H vs L	3	4	3
1st to last ins. (days) – 1. lact.	0	-2	0
1st to last ins. (days) – 2. lact.	-2	-3	0

Results for health

Half with H NTM compared to half with L NTM (% units)			
Breed	RDC	HOL	JER
Mast. index difference H vs L	6	3	3
Mastitis (treat.*) - 1. lact.	-3	-3	-3
Mastitis (treat.*) - 2. lact.	0	-2	-2
Other diseases (treat.*) - 1. lact.	-1	-3	0
Claw health (treat.*) – 1. lact.	0	-4	-2

***Treatment: yes/no**

Results for survival

Half with H NTM compared to half with L NTM (% units)			
Breed	RDC	HOL	JER
Index difference H vs L	6	5	3
Survival to 1. - 2. lact.	4	3	4
Survival to 1. - 3. lact.	8	6	7

Subconclusion

NTM have effect in nearly all traits and all breeds!
But does it work regardless of management level in herd?

Statement: In my herd I have lower than average incidence of disease. Therefore I don't use NTM, but select bull with high yield indices

Good idea?

Genetic effect depending of phenotypic level

- Data from all Holstein herds
- Define herd type – phenotypic/management level
- Effect of index within herd type

Best managed herds

Average managed herds

Worst managed herds

Yield index

Herd type	Difference in yield index - H compared to L half within herd		
	H index	L index	Difference
Worst	108.9	99.0	9.9
Average	109.7	99.7	10.0
Best	110.5	100.5	10.0

Best 305-day F+P

Average 305-day F+P

Worst 305-day F+P

Yield index

Herd type	Herds divided by kg F+P Yield index: H compared to L half within herd Difference in F+P yield	
	Kg 305-day F+P	
	1. lactation	2. lactation
Worst	+27	+30
Average	+32	+37
Best	+35	+39

Fertility index

Herd type	Herds divided by 1. to last insemination Fertility index: H compared to L half within herd Difference in 1. to last insemination		
	1. to last insemination (days)		
	Heifer	1. lactation	2. lactation
Worst	-1.4	-8.7	-6.5
Average	-0.8	-7.4	-7.5
Best	-1.3	-6.1	-7.7

Same genetic difference between H and L group in all herd types – see handout

Mastitis – how to define good management

True management level	Mastitis treatments	Somatic cell count (SCC)
Good	Lower threshold -> many treatments	OK
Bad	OK	Lower threshold -> many treatments -> low SCC

Looking at both management definitions gives good indication!

Mastitis index

Herd type	Herds divided by mastitis/SCC/yield Mastitis index: H compared to L half within herd Difference in mastitis/SCC					
Management definition:	Mast. treatment		SCC		Yield	
Effect on:	Mast. treatment (% units)		SCC (geo. cells)		Mast. treatment (% units)	
	1. lact.	2. lact.	1. lact	2. lact.	1. lact	2. lact.
Worst	-9.8	-8.7	-0.109	-0.120	-6.8	-5.4
Average	-6.6	-7.0	-0.111	-0.123	-6.3	-6.2
Best	-3.8	-3.6	-0.100	-0.112	-7.0	-7.3

Same genetic difference between H and L group in all herd types – see handout

Subconclusion

Regardless of management level for the specific trait, indices for yield, fertility and mastitis have similar effect in:

- Kg F+P
- Interval between 1. and last insemination
- Risk of mastitis treatments

Not a good idea to put more emphasis on yield index in herds with lower than average incidence of disease – just use NTM

Genetic effect depending of phenotypic level
Another approach for Holstein

Best: Mast. treat./ SCC

Average: Mast. treat./ SCC

Worst: Mast. treat./ SCC

Mastitis

Correlation: Pedigree index for mastitis and culling at 700 days in milk

Question: Do health index matter less if herd health is better?

Mastitis index

Herd type	Correlation between ped. index for mastitis and culling at 700 days in production	
Management definition	Mastitis treatments	SCC
	Corr	Corr
Worst	-0.066	-0.063
Average	-0.047	-0.049
Best	-0.046	-0.050

Mastitis index

Herd type	Correlation between ped. index for mastitis and culling at 700 days	Effect of P-index
Management definition	Mastitis treatments	
	Corr	Kg protein
Worst	-0.066	2.52
Average	-0.047	2.73
Best	-0.046	2.66

Asumption: P-index have bigger effect in best herds -because less depression of production due to mastitis

Other traits - Holstein

	Correlation between ped. index and culling at 700 days		
Management definition	SCC		
	Worst	Average	Best
Yield	-0.07	-0.06	-0.05
Fertility	-0.05	-0.06	-0.06
Calving	-0.01	-0.02	-0.02
Other diseases	-0.04	-0.04	-0.04
Udder	-0,01	0.00	0.00
Longevity	-0.08	-0.08	-0.08
NTM	-0.10	-0.09	-0.09

More results for more breeds – see handout

Subconclusion

In all types of herds, farmers have nearly equal effect of mastitis index and other indices

Not a good idea to put more emphasis on special indices in herds different management levels – just use NTM

Main conclusion

NTM is a super tool that has a large effect – in all herd types!

Important message when branding NTM

Fertility index

Herd type	Difference in fertility index - H compared to L half within herd		
	H index	L index	Difference
Worst	106.3	97.2	9.1
Average	106.6	97.5	9.1
Best	106.7	97.5	9.2

Best: 1 to last ins.

Average: 1 to last ins.

Worst: 1 to last ins.

Mastitis index

Herd type	Difference in mastitis index - H compared to L half within herd. Herds divided by freq. mastitis treatments		
	H index	L index	Difference
Worst	104.5	96.0	8.5
Average	104.4	96.0	8.4
Best	104.0	96.0	8.0

Other traits - Holstein

	Correlation between ped. index and culling at 700 days		
Management definition	SCC		
	Worst	Average	Best
Yield	-0.06	-0.06	-0.05
Beef	0.00	0.01	0.01
Fertility	-0.05	-0.06	-0.06
Birth	-0.03	-0.02	-0.03
Calving	-0.01	-0.02	-0.02
Mastitis	-0.06	-0.04	-0.05
Other diseases	-0.04	-0.04	-0.04
Claw health	-0.04	-0.04	-0.04
Body	0.03	0.01	0.02
Feet&legs	-0.03	-0.02	-0.03
Udder	0.00	0.00	0.00
Milking speed	0.02	0.01	0.00
Temperament	-0.01	-0.01	-0.01
Longevity	-0.08	-0.08	-0.08
NTM	-0.10	-0.09	-0.09

Other traits - RDC

	Correlation between ped. index and culling at 700 days		
Management definition	SCC		
	Worst	Average	Best
Yield	-0.12	-0.11	-0.12
Beef	-0.02	-0.01	-0.03
Fertility	-0.03	-0.01	-0.01
Birth	-0.01	0.00	0.01
Calving	0.01	-0.01	0.00
Mastitis	-0.03	-0.04	-0.01
Other diseases	-0.04	-0.03	-0.03
Claw health	-0.03	-0.02	-0.01
Body	0.02	0.01	0.03
Feet&legs	-0.05	-0.03	-0.05
Udder	0.00	0.00	0.02
Milking speed	-0.04	-0.03	-0.01
Temperament	-0.01	-0.02	-0.07
Longevity	-0.07	-0.08	-0.08
NTM	-0.12	-0.11	-0.11

Other traits - Jersey

	Correlation between ped. index and culling at 700 days		
Management definition	SCC		
	Worst	Average	Best
Yield	-0.07	-0.04	-0.03
Beef	-0.01	0.00	-0.01
Fertility	-0.02	-0.02	0.01
Birth	0.00	-0.01	0.01
Calving	-0.01	-0.01	0.00
Mastitis	-0.04	-0.02	-0.02
Other diseases	0.00	-0.01	0.00
Claw health	0.01	-0.01	0.02
Body	-0.01	-0.02	0.00
Feet&legs	-0.01	-0.02	0.00
Udder	-0.02	-0.02	0.00
Milking speed	-0.01	-0.02	-0.04
Temperament	-0.01	-0.01	-0.01
Longevity	-0.06	-0.03	-0.03
NTM	-0.08	-0.06	-0.04