Teaming up for animal health

Testing trace elements in bulk milk as a tool in providing the optimal amount to dairy cattle

J. Muskens, G.H. Counotte

GD Animal Health
Deventer, The Netherlands

Testing trace elements in bulk milk: why?

- Deficiency and/or excess: both can have negative effects on health, production, etc.
- Minerals: high costs for dairy farmers
- Regular testing of bulk milk:

- good monitoring system of intake important trace elements
- current intake
- easy: no extra work for farmer
- farmer gets new results together with previous results: have possible changes in mineral supply the desired effect?

Composition program

- Voluntary program
- 2013: testing selenium (Se) en iodine (I)
- 2014: also testing copper (Cu) and zinc (Zn)
- 2018: also testing phosphorus (P)
- Testing bulk milk 2, 4 or 6 times/year: always ≥ 1x in summer + winter
- Costs/year: 89, 149, and 205 € (2018)
- Starting with 2600 herds, now > 3000 herds (± 20% of all Dutch dairy herds)
- Results are used for optimize the quantity of mineral supply for dairy herds together with feed adviser and/or veterinarian

Explanation results

Levels (µg/L)	Deficiency	Low-normal	Normal	High-normal	Possible excess
Iodine	< 25	25 - 100	100 - 300	300 - 500	≥ 500
Selenium	< 10	10 - 16	16 - 35	35 - 45	≥ 45
Zinc	< 3400	3400 - 4000	4000 - 5200	5200 - 6000	≥ 6000
Copper	< 20	20 - 35	≥ 35: no indication for deficiency		
Phosphorus (different!)	Level of P-excretion in bulk milk: useful for calculating the desired amount of P in ration				

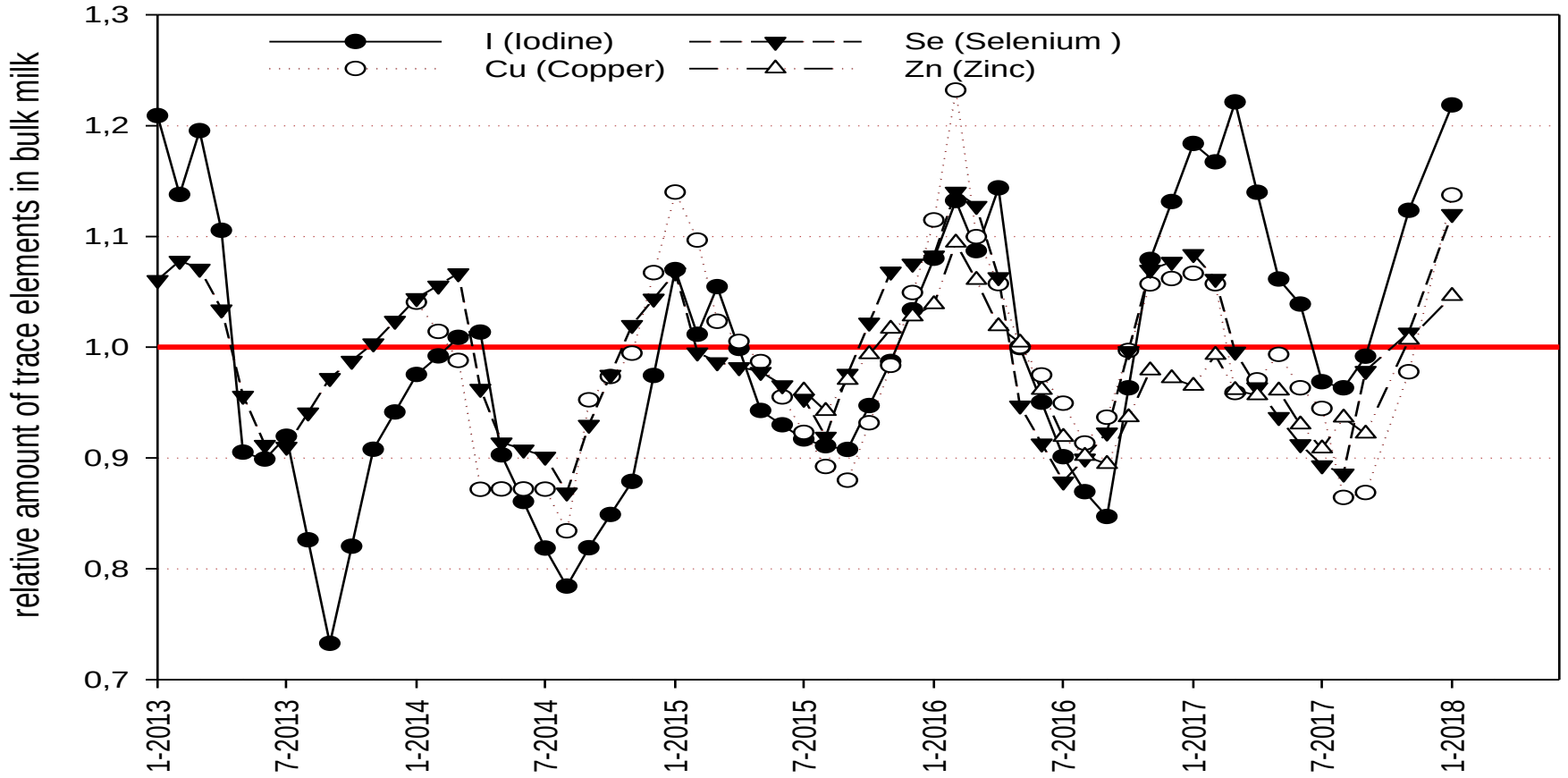
Results bulk milk all herds 2017: selenium

Test period (month number) Test result (µg/L)	1	3	5	7	9	11	Total
< 10 deficiency	0%	0%	2%	2%	1%	1%	1%
10-16 low-normal	5%	14%	21%	28%	9%	15%	16%
16-35 normal	92%	85%	76%	69%	88%	81%	81%
35-45 high normal	3%	2%	1%	1%	1%	3%	2%
≥ 45 possible excess	0%	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%

Results bulk milk all herds 2017: zinc

Test period (month number) Test result (µg/L)	1	3	5	7	9	11	Total
< 3400 deficiency	0%	0%	1%	2%	1%	0%	!%
3400-4000 low-normal	12%	11%	15%	34%	29%	7%	19%
4000-5200 normal	86%	88%	83%	63%	69%	89%	79%
5200-6000 high normal	2%	1%	1%	1%	1%	4%	2%
≥ 6000 possible excess	0%	0%	0%	0%	0%	1%	0%
Total	100%	100%	100%	100%	100%	100%	100%

Results trace elements bulk milk: trends



Example: results of one dairy farm

	Current result of this herd 07/18	Target value	Mean*	Defi-ciency	Low normal	Normal	High normal	Possible excess
Iodine	58	100-300	180					
Selenium	8.3	16-35	20.7					
Zinc	3785	4000-5200	4193					
Copper	24	≥ 35	56					
Phosphorus	1.07	No						

*: mean of test results in this period of all tested herds

Results	July 2018	May 2018	March 2018	Nov. 2017	Aug. 2017
Iodine	58	221	116	130	23
Selenium	8.3	9.8	19.3	23.6	11.2
Zinc	3785	3807	3811	3582	3758
Copper	24	26	46	51	46
Phosphorus	1.07	1.07	1.15		

Information to farmer based on test results

- General advices
- Possible clinical signs if results are non-normal
- Possible reasons for non-normal results, e.g.:
  - feeding too much or too few minerals
  - if Cu is deficient: caused by low Cu and/or excess of Mo, S, Fe and/or Zn?
  - etc.
- Compare the results with previous and next results together with your feed advisor(s)
- Possibilities of testing other cattle groups, like dry cows and young stock


Thanks for you attention!
Any questions?