

RATIONAL NUTRITIONAL EXPLORATION OF TRACE ELEMENTS

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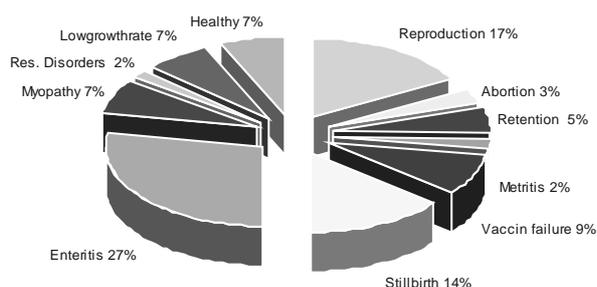
Introduction

The trace elements supply is one of the most important conditions for health maintenance(2). Animal's needs are known (INRA, NRC ...) and covered by nutriment and/or mineral complementation. The evaluation of animal's status of trace elements can be obtained with different protocols : nutrients balance or dosages of trace elements in different biological supports : organs, milk, urine or blood. Our laboratory is specialized in biochemistry in blood, urine and milk. Statistical tests were realised to show relations between animal's status and health disorders.

Material and methods

We are consulted to realize nutritional explorations in blood of cattle which present an identified disorder. Figure 1 shows the disorders studied for nutritional exploration in French beef cattle.

Fig 1 : motivations of nutritional explorations, 1700 beef cattle.



Nutritional exploration can be performed through different measurement :

- Trace elements in blood (copper, zinc, selenium, iodine), but also in tissues like liver (copper) or kidney (selenium) to estimate reserves or to detect an excess.
- enzyme activity or hormones depending on trace elements : glutathion peroxydase (selenium), thyroxin (iodine).

Animal's nutritional statuses can be classified in 5 categories (1) :

- **adequate** : values mesured guarantee a normal homeostasy.
- **marginal** : shows a tendency to the exhaustion of reserves. This status can have non specific consequences like lower immune defences.
- **subclinical** : organism cannot correctly guarantee vital functions depending on the trace element.
- **clinical** : consequences can be used for diagnostic.

- **excessive** : revealing either excess or biological abnormalities independant on the trace element (an inflammatory status increases plasma copper)

Tableau 1 : status of 126 beef cattles situated in the west of France

Results

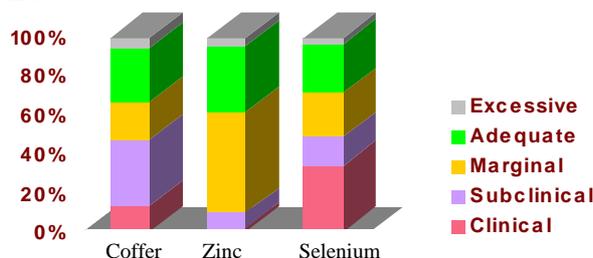


Tableau 2 : relations between uejiciency and health disorders

	Copper	Zinc	Sélénium
Reproduction	Clinique	Marginal	Marginal
Abortion	Clinique	Subclin.	Marginal
Retained Fœtal Mbne	NS	Subclin.	Marginal
Métritis	??	??	Subclin.
Vaccinal failure	Subclin.	Subclin.	Marginal
Still Birth Syndrome	Subclin.	Subclin.	Marginal
Entéritis	Subclin.	Subclin.	Marginal
Myopathy	NS	Marginal	Marginal
Respiratory Troubles	NS	NS	Marginal
Growth Failure	Subclin.	Marginal	Marginal

Discussion

Most of cattle which participated in this study present insufficient status in selenium, zinc and copper. Informations concerning iodine were not sufficient to properly perform a statistic analysis.

Deficiencies, also marginal, in selenium have repercussions on the disorders discribed.

This winter, we were confronted with important disorders of stillbirth and morbidity. The exploration of calve's immune status showed a failure of immunity transfert in relation to mother's deficiencies of trace elements (results presented in table 2). These results are coherent with Rollin's publication (4).

Conclusion

The exploration of nutritional status is a usefull tool in the global investigation of cattle (3). The use of trace elements is not reduced to a blindly flushing, but it participates to the managment of health and production, so in the profitability of the farms. Specific supplementations, adapted to every cattle according to the results of the analysis, can improve rapidly immune status, reproduction performance and calves vitality.

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