

# ETHICS and DOPING


## Focus on cobalt

Dr Brieuc DE MOFFARTS  
DVM, MSc, PhD

Dr Marie-Capucine DUPUIS TRICAUD  
DVM, MCMVS, PhD

# Cobalt inquiry: Horses given 'unknown' injections

December 21, 2015

 [Read later](#)

## Horse racing trainers resigned to bans for cobalt

THE AUSTRALIAN | JANUARY 20, 2016 12:00AM



SAVE



**IS COBALT A KILLER IN HORSES?**

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## Australian Vets Condemn Cobalt Misuse in Horses

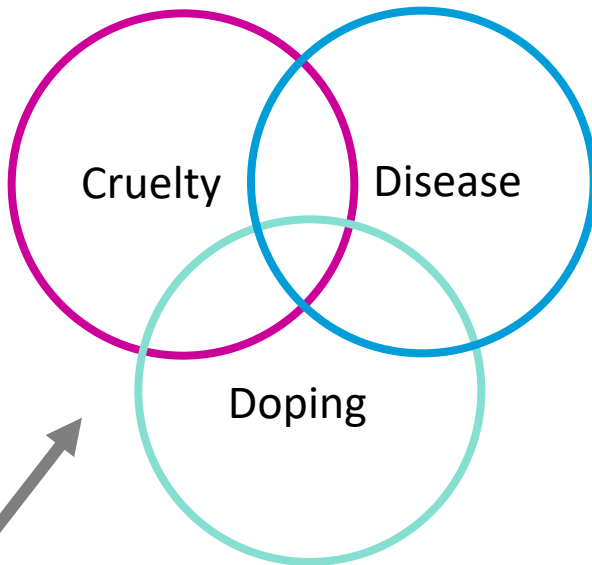
By Edited Press Release | Dec 11, 2015 | Topics: Medications, Thoroughbred Racing, Drug Testing, Horse Industry News

Ethics is a question of recognized values, for example:

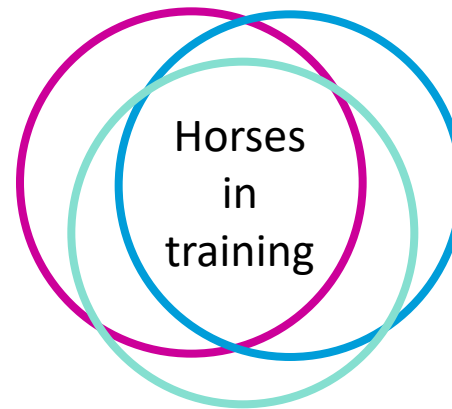
**Health**

**Well-Being**

**Performance**

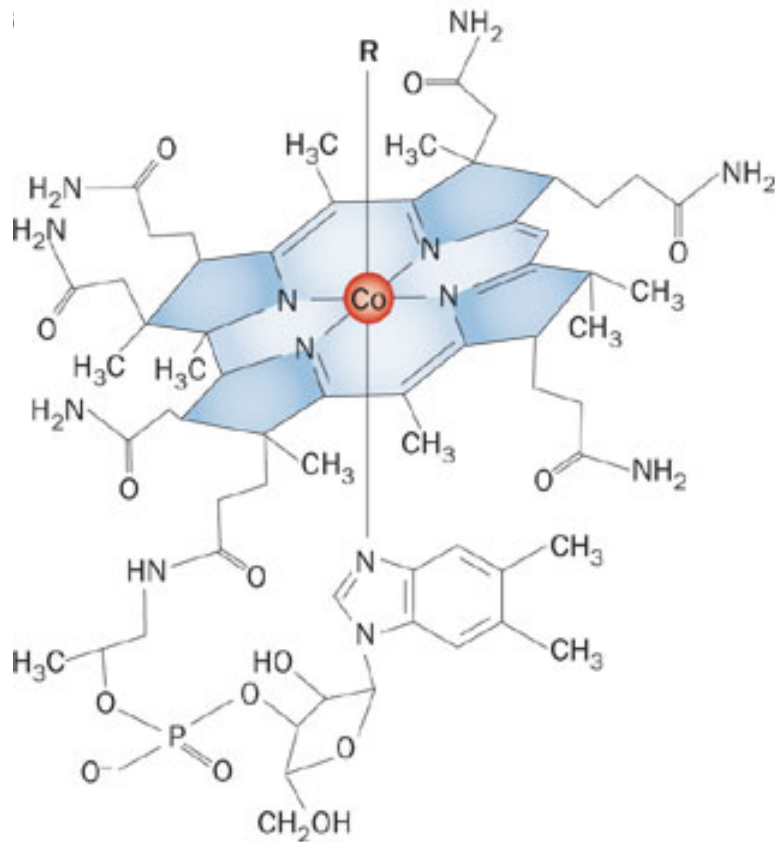


Public point of view



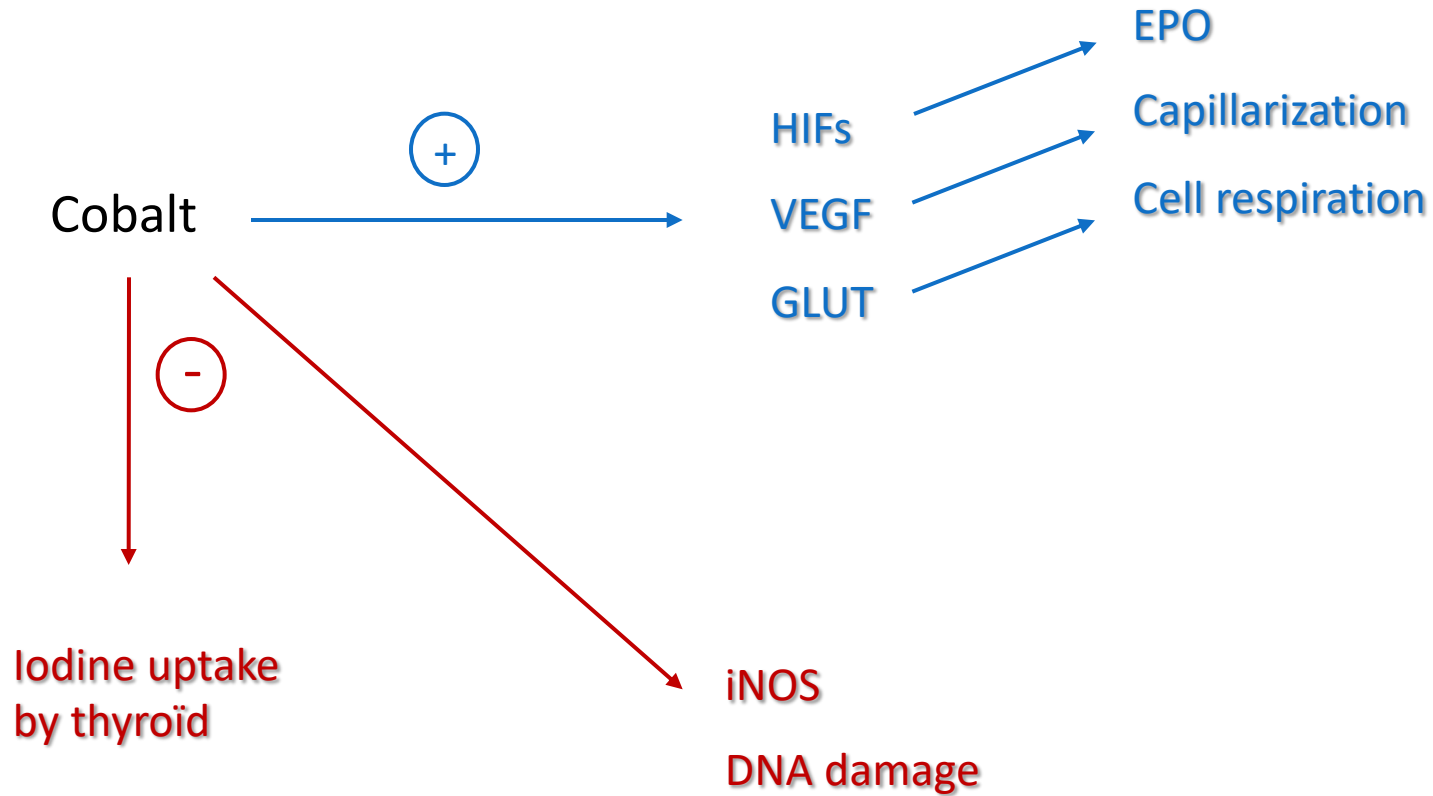
Professional point of view

# FOCUS ON COBALT



- Cobalt :
  - Mineral element component of B12 vitamin (cobalamin)
  - Essential for red blood cell formation
  - Induces numerous genes expressions, but will rapidly be toxic
- Cobalamin is not able to enhance performance except if deficiency is diagnosed

# FOCUS ON COBALT



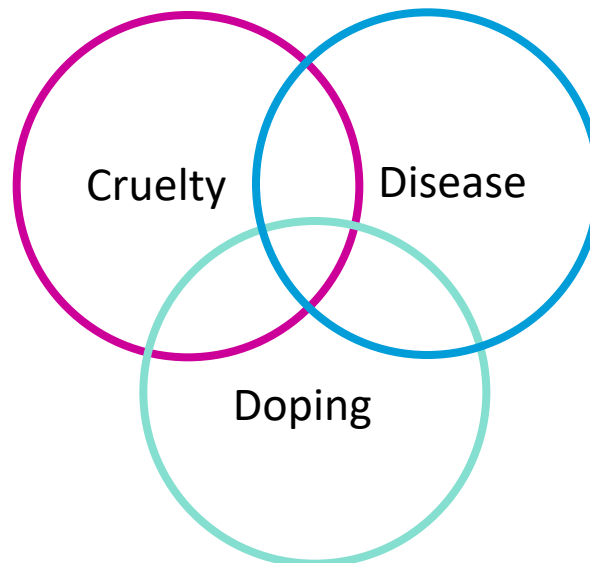
# FOCUS ON COBALT

- Nutritionally a horse needs
  - 1mg/day at rest
  - 7mg/day in full training
- Legally EuroLex indicates a maximal daily intake of 10mg in additional feeds.



# FOCUS ON COBALT

- But cobalt in equine also supports performance and can be detrimental to health and well-being
- 40mg is a subtoxic dose



# FOCUS ON COBALT

- Extended level of cobalt in equine is considered doping
- A level of **100ng/ml of cobalt in urine** seems to be the upper limit in Europe.
- Additionally **25ng/ml of cobalt in plasma** is also a relevant threshold (US).



# FOCUS ON COBALT

- Daily needs for a horse in training: **7 mg**
- TWYDIL RACING: 3.5mg/day
- TWYDIL HEMATINIC: 5 to 6 mg/day
- TWYDIL HEMOPAR: 0.5mg/day
- 2 forms: Cobalamin (vit B12) or inorganic sources of  $\text{Co}^{++}$



# Effect of TWYDIL HEMATINIC



## Purposes:

Effet of TWYDIL HEMATINIC on blood parameters

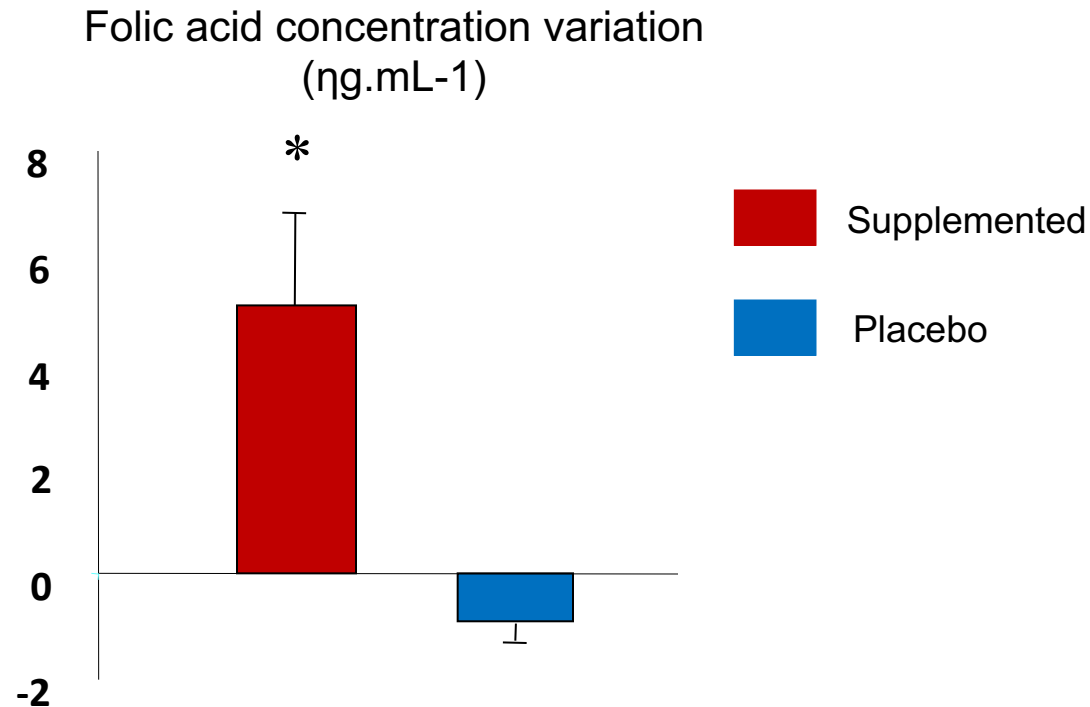
1. Evaluation of the TWYDIL HEMATINIC components bioavaibility
2. Evaluation on healthy horses of the impact of the supplement on red blood cells regenerative mechanism

## Purposes:

### Effet of TWYDIL HEMATINIC on blood parameters



#### 1. Evaluation of the TWYDIL HEMATINIC components bioavaibility

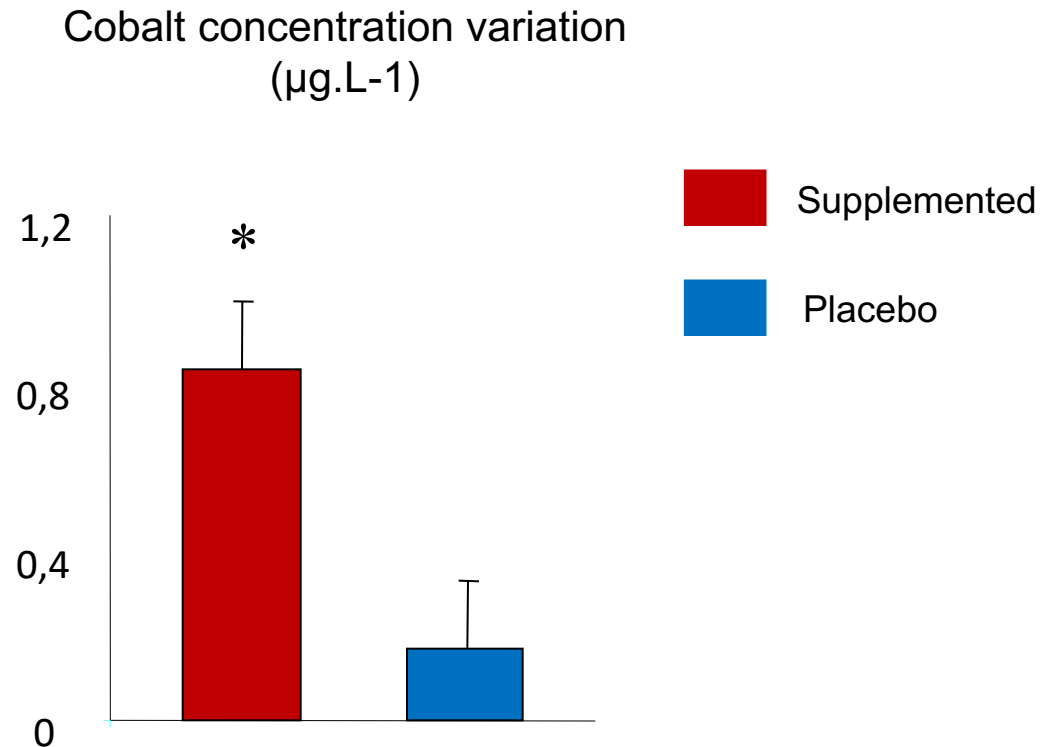


## Purposes:

### Effet of TWYDIL HEMATINIC on blood parameters



#### 1. Evaluation of the TWYDIL HEMATINIC components bioavaibility



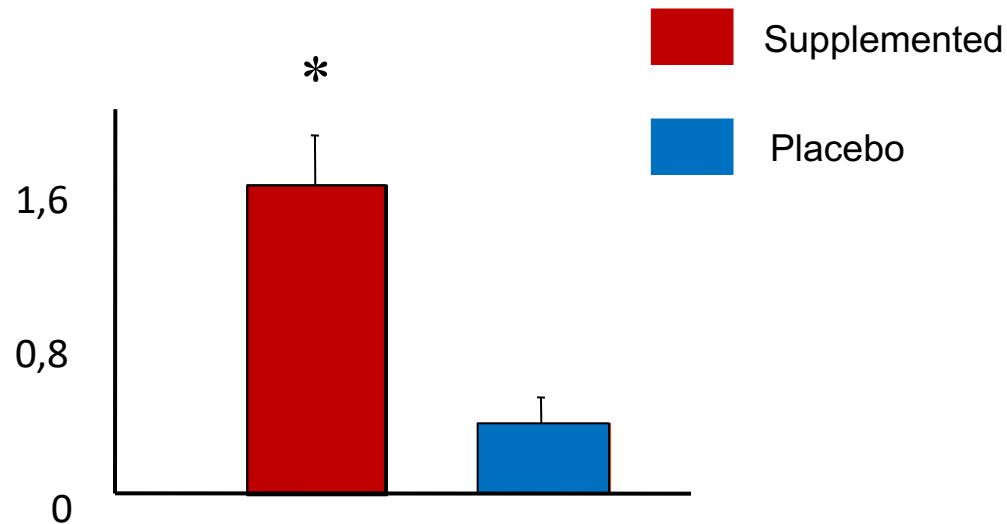
## Purposes:

### Effet of TWYDIL HEMATINIC on blood parameters



#### 1. Evaluation of the TWYDIL HEMATINIC components bioavaibility

Vitamin E concentration variation  
(mg.L<sup>-1</sup>)



10 days of TWYDIL HEMATINIC (Co++ 6.8mg) allow a significant increase of red blood cells constitutive elements and protective factors.



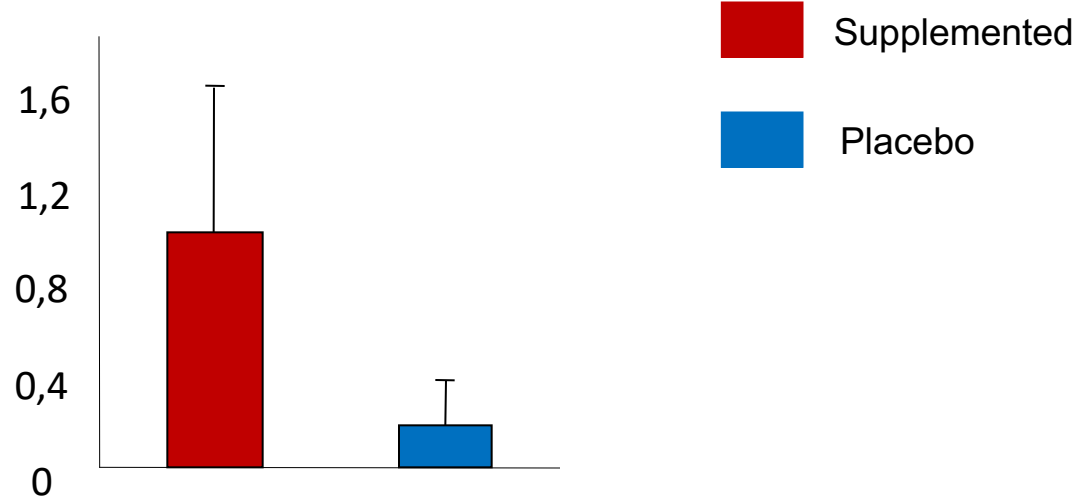
## Purposes:

### Effet of TWYDIL HEMATINIC on blood parameters



## 2. Impact on red blood cells regeneration

Haemoglobin concentration  
variation (g.100ml<sup>-1</sup>)



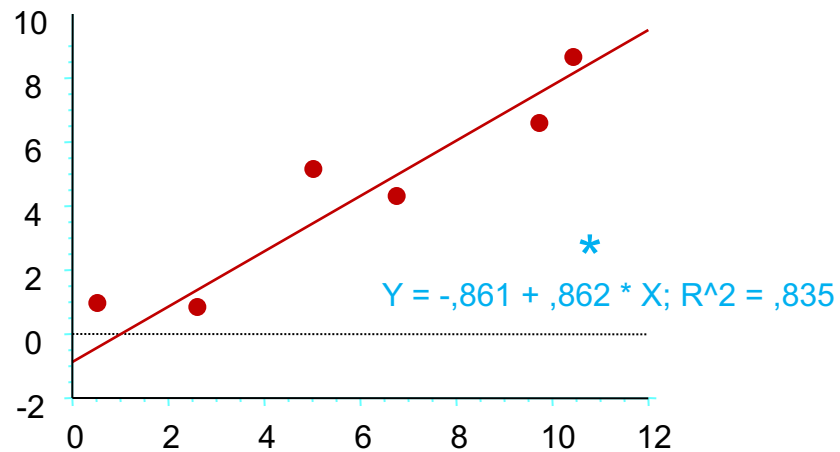
## Purposes:

### Effet of TWYDIL HEMATINIC on blood parameters



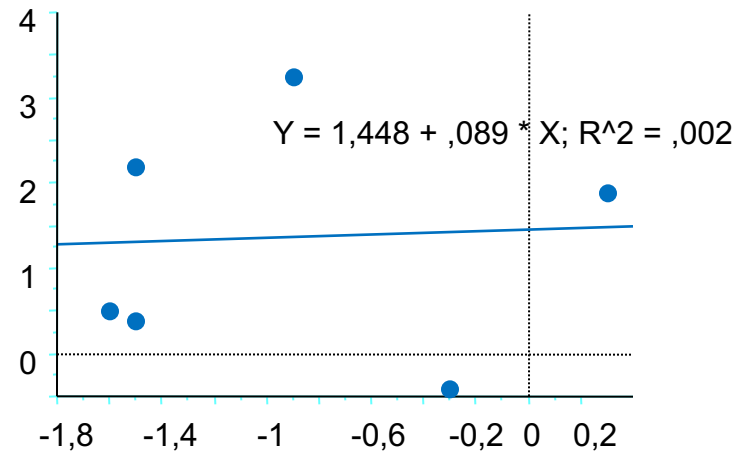
## 2. Impact on red blood cells regeneration

### Haematocrit variation in supplemented group (%)



Folic acid concentration  
variation in supplemented  
group (ng.mL-1)

### Haematocrit variation in placebo group (%)



Folic acid concentration  
variation in placebo  
group (ng.mL-1)

- A 10 day supplementation with TWYDIL HEMATINIC seems to support red blood cells regenerative mechanism
- in healthy and anemic horses without any risk of toxicity or even congestion
- this efficacy is mostly linked to the folic acid intake.



# Effect of TWYDIL program / Cobalt

## Purposes:

Effet of TWYDIL program on cobalt concentration

Evaluation of urine and plasmatic level of cobalt during 10 days of TWYDIL RACING and TWYDIL HEMATINIC administration corresponding to a total amount of 11 mg of cobalt per day



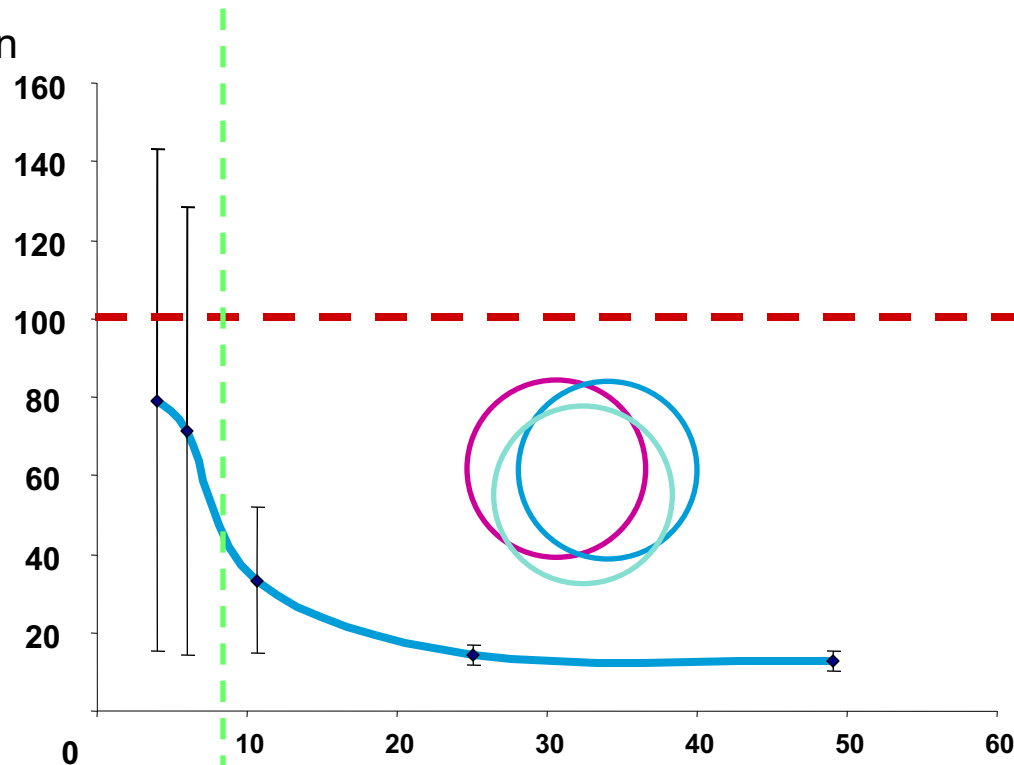
Purposes:

Effet on concentration of cobalt



1. Impact on urine concentration of 11mg of cobalt after 10 days of administration

Urine concentration  
of cobalt (ng/ml)



Time (h) after last  
administration

Purposes:

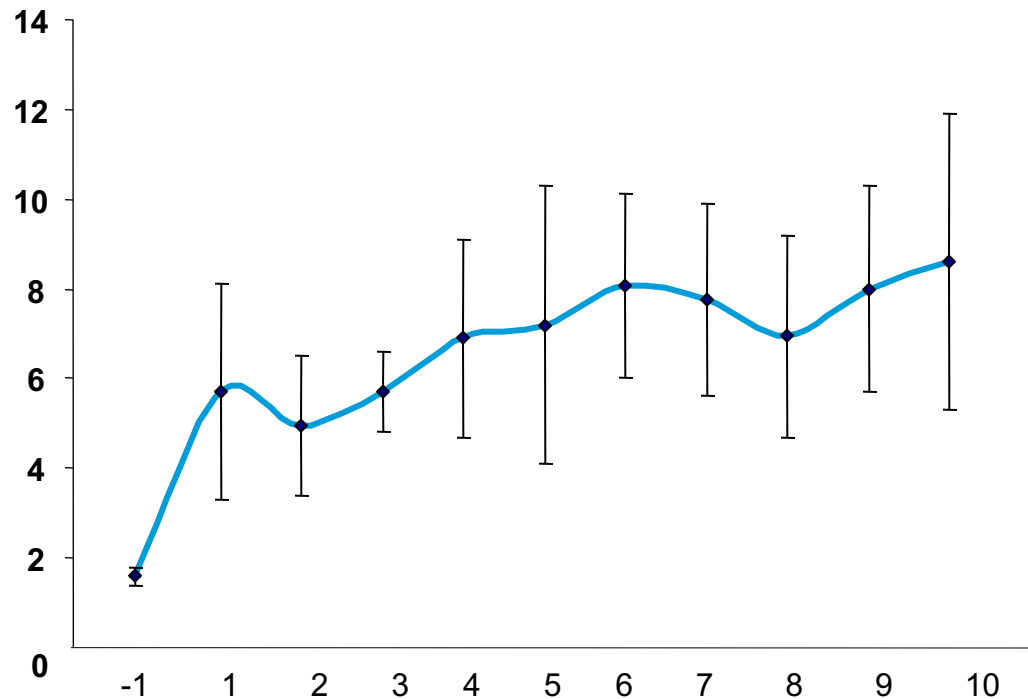
Effet on concentration of cobalt



2. Impact on plasmatic concentration of 11mg of cobalt during 10 days of administration

(US Threshold: 25 ng/ml)

Plasmatic  
concentration  
of cobalt  
(ng/ml)



Time (days) of  
administration

## Conclusion:

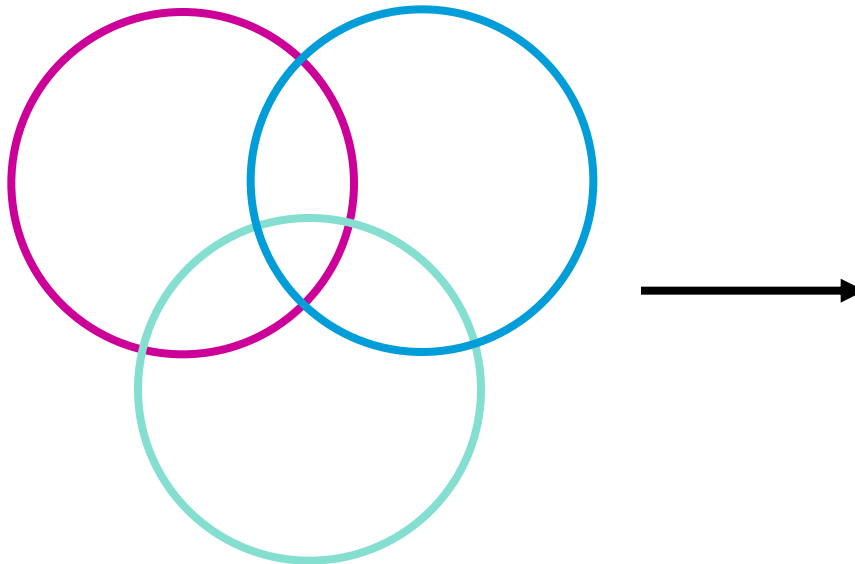
### Effet on concentration of cobalt

- No cumulative effect of cobalt orally absorbed in urine
- Possibility of cumulative effect in plasma
- 72h are sufficient in order to eliminate totally the cobalt in the urine

Estimation: 20 mg/day of orally absorbed cobalt is the limit beyond which there is a risk to exceed 25 ng of cobalt per ml of plasma, for a probable duration over 72hours.

# CONCLUSION

- Even with a legal daily dose of cobalt into the feed, **a risk of positive case during the 10 hours** following the administration is present.
- Respect dose and duration



Doping authorities must take a margin of security to protect :

betting system and income,

their mission,

the image of sport,

...