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Analysis of "non-hormonal" nutritional supplements for prohormones

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Nutritional supplements analysed for prohormones

- 153 "non-hormonal" nutritional supplements since May 1999
- Mainly from follow up studies of positive norandrosterone cases
- Analyses of the supplements from the athletes and original packed supplements

Results of analyses of 153 "non hormonal" supplements

- 18 different supplements from 12 different companies contained prohormones, not declared on the label
- 15 of the 18 supplements contained 19-norsteroids
- The contaminated supplements have been bought in USA, UK, Sweden, Norway, Germany, Belgium, Israel

Occurrence of contaminations

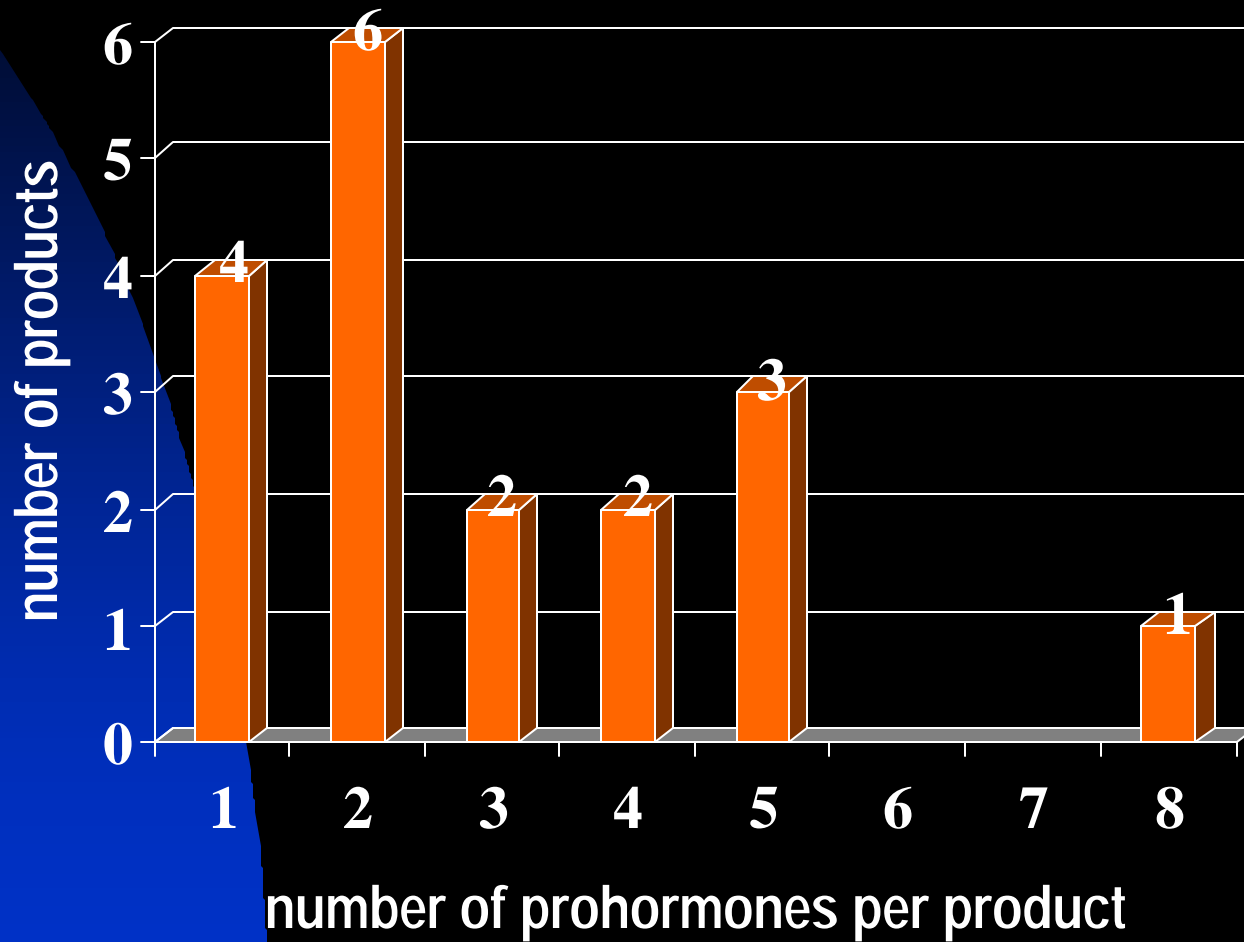
- tablets
- capsules
- powders
- drinking ampouls
- oily solutions



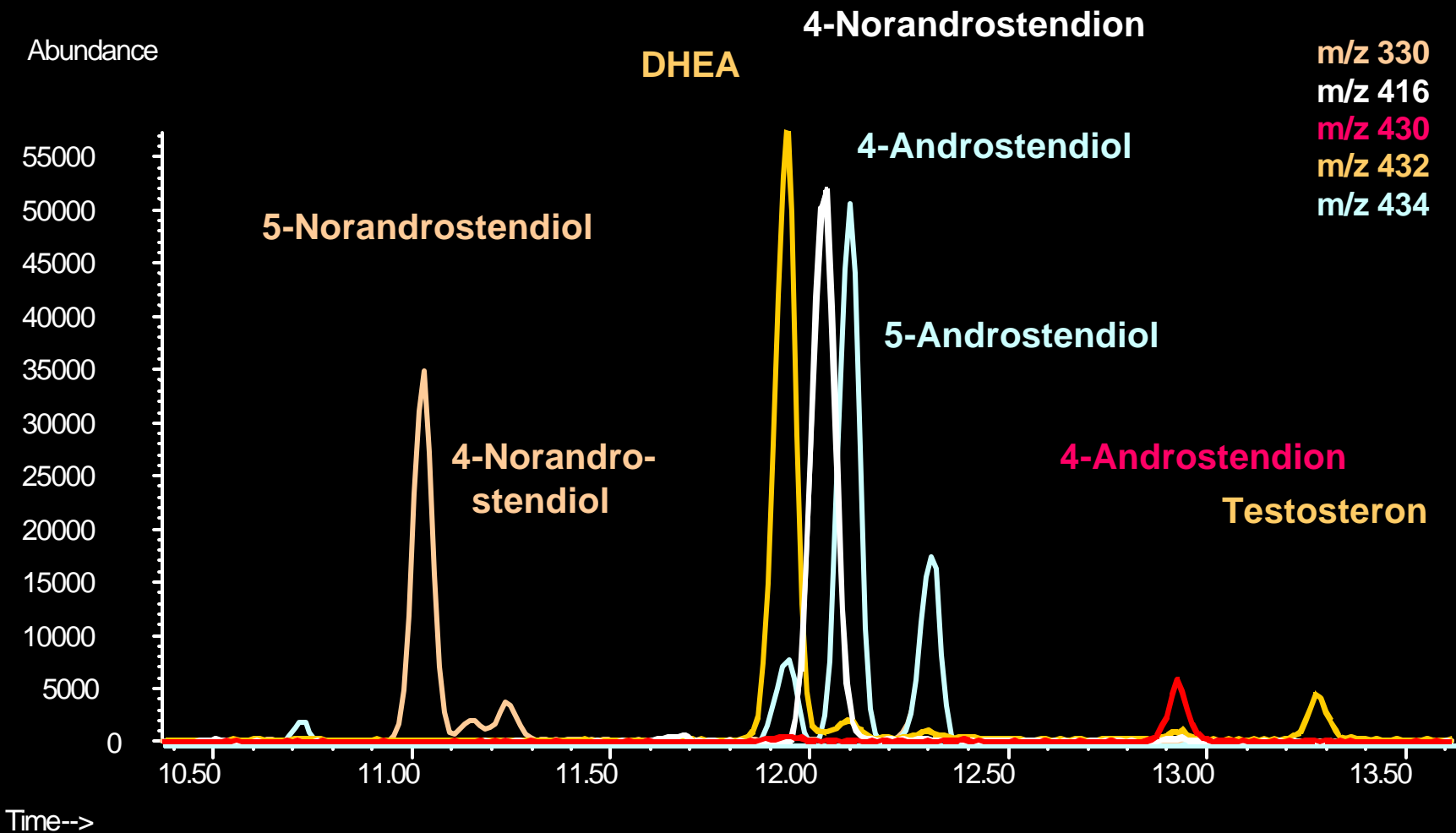
Contaminated nutritional supplements

- creatine
- carnitine
- vitamines + minerals
- tribulus terrestris
- ribose
- BCAA
- OKG
- zinc
- pyruvate
- chrysin
- guarana
- CLA and other oils
- herbal extracts
- glutamine

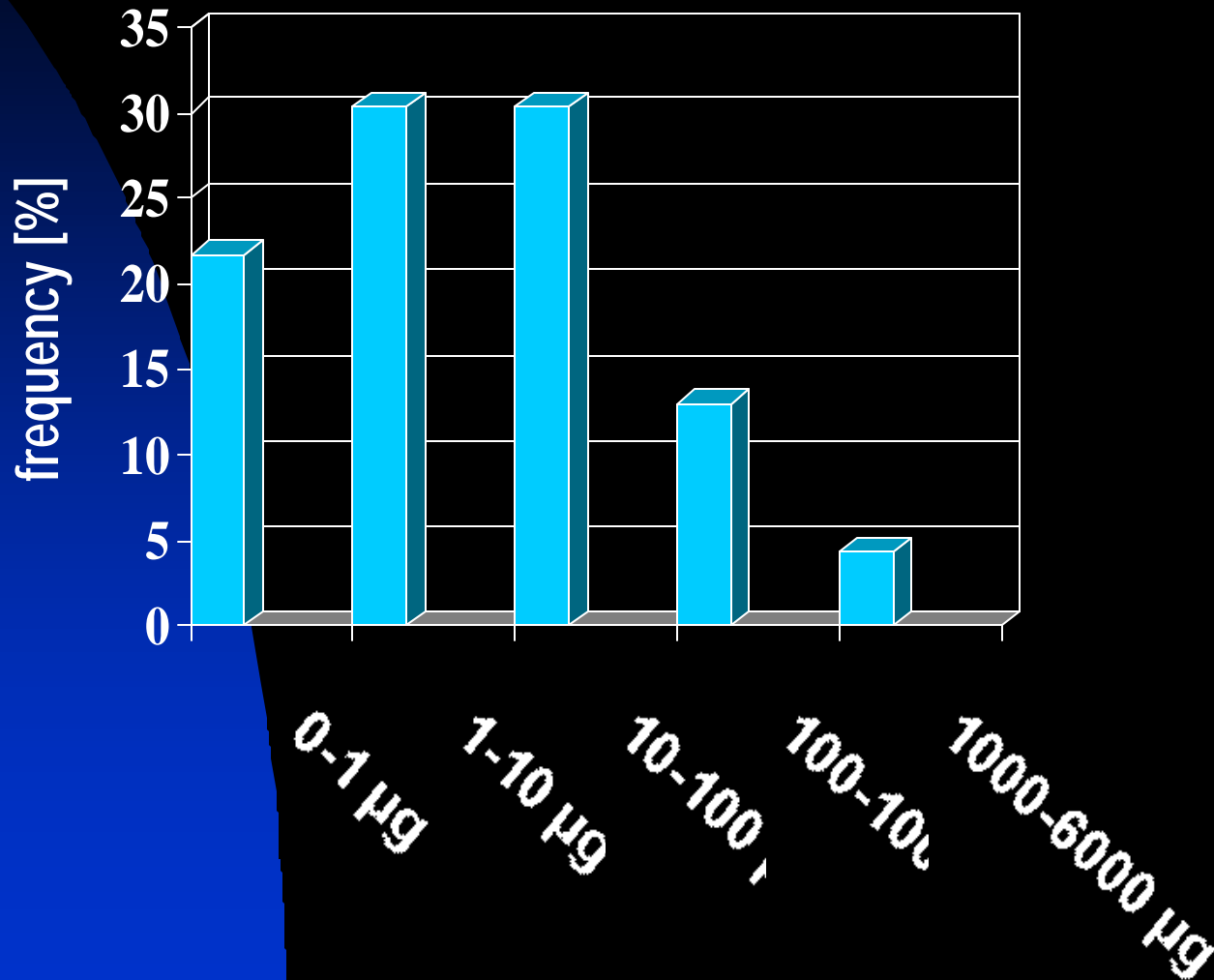
Number of prohormones per product



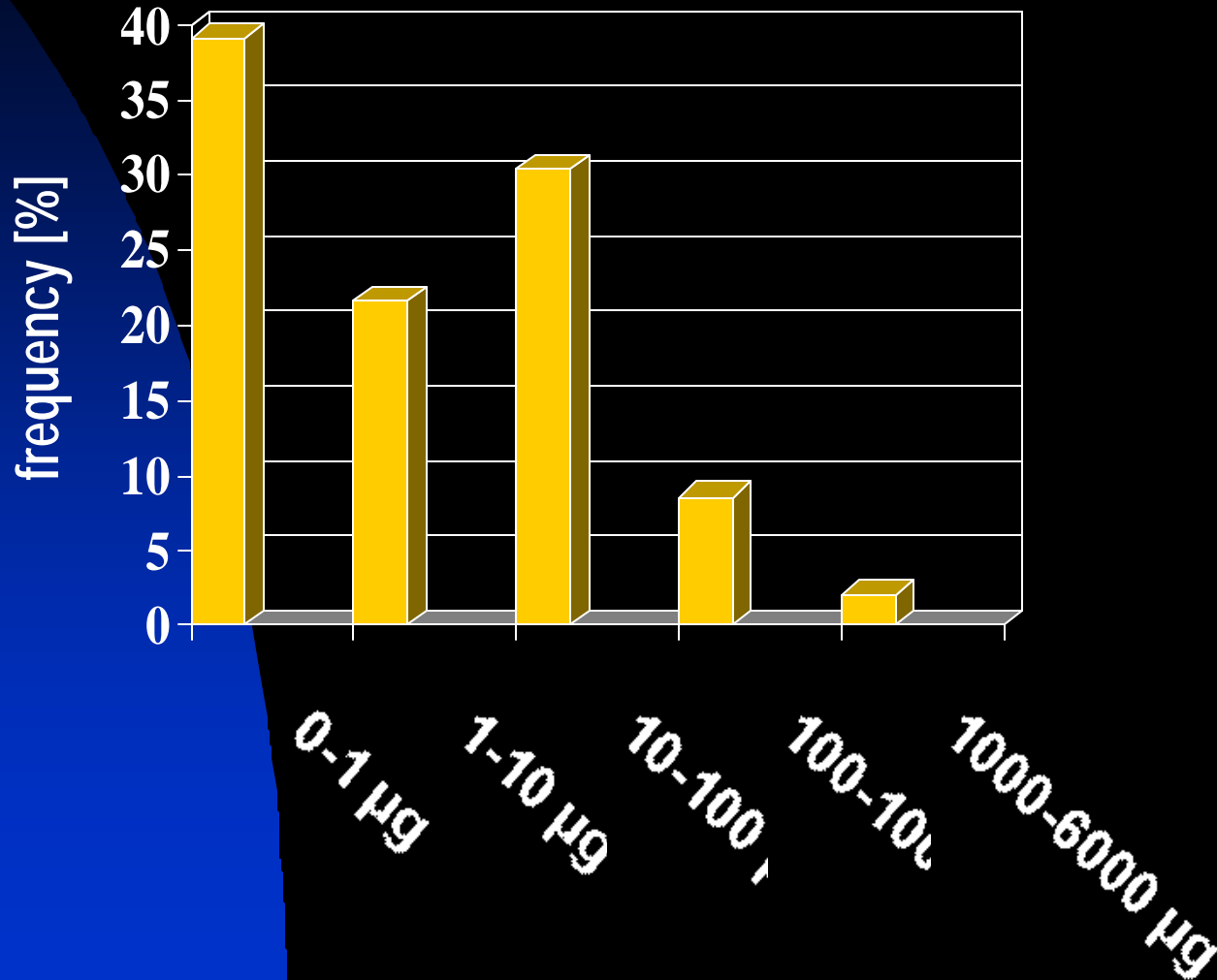
Not declared prohormones in a creatine product



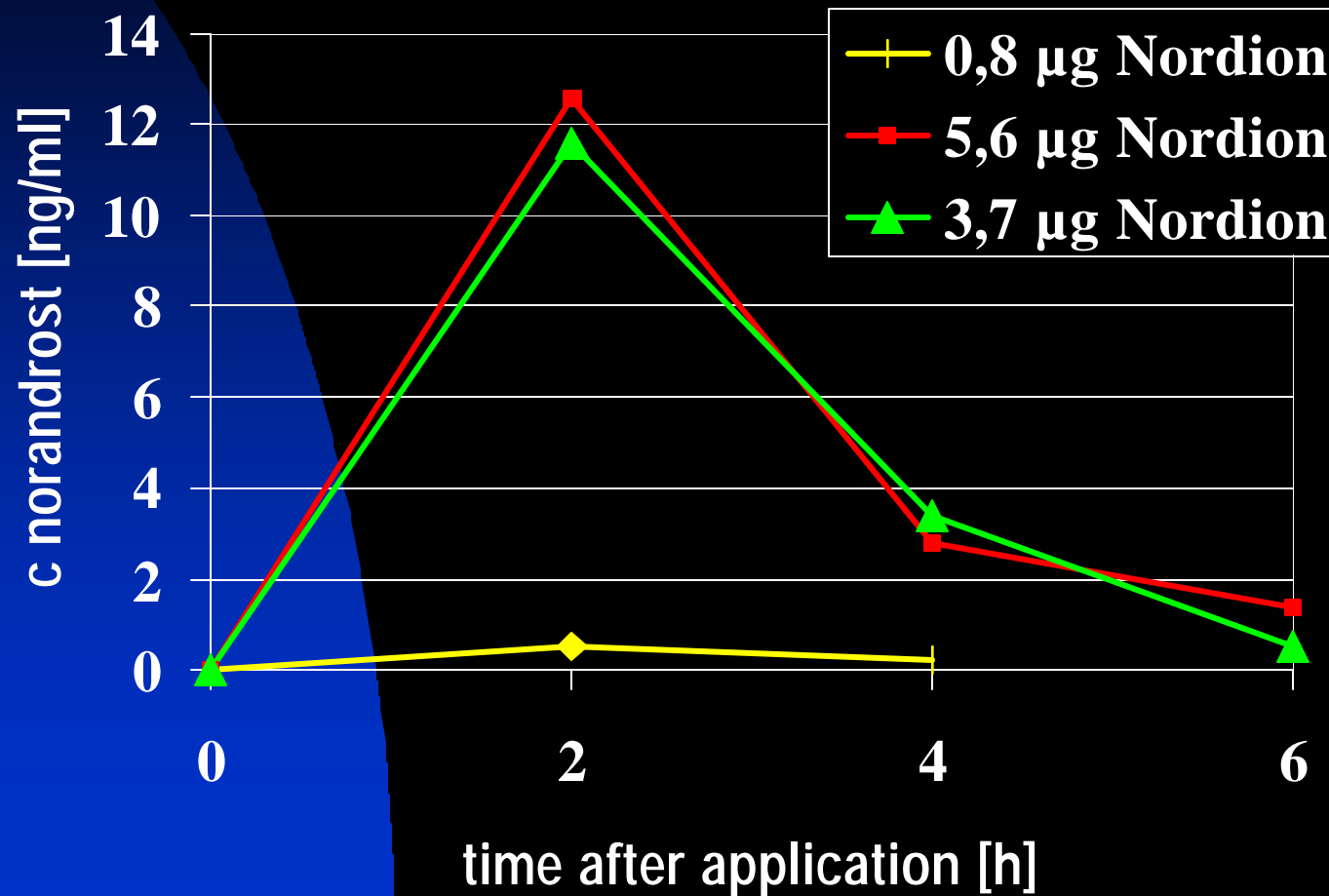
Concentrations of prohormones (per capsule / per tablet) in contaminated nutritional supplements (n=46)



Concentrations of 19-norsteroids (per capsule / per tablet) in contaminated nutritional supplements (n=46)



Urinary norandrosterone concentrations after application of nutritional supplements contaminated with 4-norandrostendione



Conclusions

- Recommendations to athletes to use only supplements with quality control for prohormones
- Classification of prohormones as medicaments (GMP)
- General discussion about the sense of the use of nutritional supplements in sports.