ABUSE OF ANABOLIC AGENTS IN BEEF CATTLE: BILE AS A POSSIBLE ALTERNATIVE MATRIX FOR OFFICIAL CONTROL

F. LEGA, R. ANGELETTI, L. RIGONI, G. BIANCOTTO, C. BENETTI, D. GIUSEPPONI, SIMONE MORETTI and R. GALARINI

1: Istituto Zooprofittico Sperimentale delle Venezie, Food safety department - Chemistry Laboratory, Legnaro (PD), Italy 2: Istituto Zooprofittico Sperimentale dell’Umbria e delle Marche, Perugia, Italy

INTRODUCTION

The use of hormonal substances in food producing animals is banned in Europe since 1988. The contrast of hormone abuses can be improved by the implementation of new hyphenated techniques or by the application of well established analytical methods to new biological matrices where, hopefully, matrix interferences are reduced and/or residue concentrations are increased.

In this work the bilateral excretion of a selected package of substances after two different in vivo growth-promoting treatments (zeranol and trenbolone/estradiol) was studied in cattle. In the first experiment (A), a first group was treated with zeronol and a second one received feed contaminated with zearalenone, the Fusarium mycotoxin that is metabolized to zeronol. In the second one (B), a control group and a group implanted with a combination of trenbolone acetate and estradiol were involved. Suitable LC-MS/MS methods applying either ESI or APCI sources were developed and validated to quantify the compounds of interest at trace levels. The final aim was to add new knowledge about the metabolic patterns and the associated kinetics of elimination in bile after growth-promoting practices.

MATERIALS AND METHODS

Experiment A

In vivo Metabolism of Zeronol and Zearalenone in Cattle

Zeronol treatment

Treated (16) Implant with 3x2 mg of zeranol pellets (36 mg/animal)

Zearalenone treatment

Control (16) Each animal fed 3 mg/animal/day of zearalenone

Animal feedstuff contaminated with Fusarium spp.

RESULTS

Animal naturally present in urine and bile

How to distinguish zeronol abuse from contamination with Fusarium spp.?

Experimental evidences:

✓ ZER and TAL present in both groups
✓ ZER and TAL levels higher in implanted animals (group 1)
✓ Zearalanone (ZAN) Increases in group 1

CONCLUSIONS

The high concentrations of the marker residues observed in bile in both in vivo experiments compared with levels detected in urine and liver collected at the same time, corroborate the previous studies about the capability of this fluid to bioconcentrate certain anabolic substances. This suggests a new possible scenario in the control of hormone abuse at the slaughterhouse. The use of bile as target matrix could therefore permit to detect illegal hormone administration for a longer period and might represent a further tool to disclose the practice of using cocktails of anabolic compounds at very low doses.

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