

## GC-C-IRMS perspectives for controlling natural steroid abuse in cattle

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Natural steroid abuse is nowadays controlled by some confirmatory methods involving GC-C-IRMS analysis. This technique has allowed solving some affairs in the European countries during the last decade. Nevertheless, some improvements could be carried out on IRMS to apply it on a wider scale of samples. At first, the new development involved in gas chromatography and particularly the comprehensive GCxGC separation, represents an alternative for steroid analysis. In this way, some sample preparation steps could be discarded on such last generation of GCxGC-C-IRMS instrument. Another point concerns the simplification of the steroid skeleton before analysis in order to discard the derivatization step, and perhaps simplify the preparation. Some approaches such as hydrolysis or Dess-Martin reactions could be studied to analyse only the CO<sub>2</sub> coming from the carbon atoms originated from the target steroid compounds. The last but not least issue would be the reinforcement of the confirmatory result. In several cases, we observed some difficulties to conclude because the result was too close to the compliant threshold value. The other atom included in all sterane structure is the H. In the future, the measurement of 2H/1H could be measured in parallel with 13C/12C to confirm a result. Finally, the new instruments available on the market are more sensitive and probably allow controlling not only testosterone or estradiol abuse but also cortisol, nandrolone and boldenone ones for which  $\delta^{13}C$  values around the ppb are required.