

## P.29.- Traceability and identification of animal tissues by QRT-PCR

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Different animal tissue components, as bones, blood, fat and others, have been widely used in feedstuffs until the Bovine Spongiform Encephalopathy (BSE) crisis in the 90's. Nowadays, only the fish tissue components are allowed for this industrial use in pig feeding. It is uncertain if some mammalian tissues could be used as feedingstuffs in the future.

Hence, it is absolutely necessary to develop and validate an analytical method to determine the origin of feedingstuffs and: a) to prevent the cannibalism in industrial mammalian feeding; b) to avoid the fraud or accidental contamination in fish meal of mammalian meat and bone meal (MMBM); and c) the use of ruminant MBM to prevent the BSE prion transmission.

DNA-based techniques have become very important and are widely used nowadays. Advantages of DNA-analyzing methods are manifold. Thus, DNA is a relatively stable molecule, it is present in MBM samples, and can be easily detected and analyzed. Besides, DNA fingerprinting is the method of choice to identify species. The Polymerase Chain Reaction (PCR) proved to be an adequate technique for detection of small amounts of DNA, specifically amplifying a target region of template DNA in a rapid and sensitive manner. The species-specific genetic differences can be exploited to amplify selected sequences of DNA, which allows the identification of species or animal groups (eg., birds, mammals and fishes) and individual species. We have designed primers using mitochondrial DNA-specific regions, available at the GenBank database. It is important to note that the success of this approach is directly depending on such primer design. Thus, such primers should amplify only the target sequence. In particular, problems of cross-hybridization, specially between species more closely related (eg., sheep-goat and chicken-turkey) should be avoided.

In this work we have developed an strategy through DNA-based methods using our own primer design to identify 6 species (cow, goat, sheep, pig, chicken and turkey). We are also carrying out experiments to identify other 17 species (6 birds, 6 mammals and 5 fishes) present in MBM and fat. Our goal is to develop and validate a protocol to be included in the accreditation system (ENAC) in which we are involved.

Furthermore this technology will be also used to detect frauds and to guarantee food authenticity in processed food of special interest in meal products from the Andalusia region (Southern of Spain, EU).

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### **Keywords**

*Species-specific identification, PCR, MBM*