ELSEVIER

Food Chemistry 64 (1999) 1

Food Chemistry

Letter to the Editor

On the origin of meat

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Received 25 May 1998; accepted 25 May 1998

The recent paper of Hunt et al. (1997) reports a convenient and rapid method to detect the species origin of meat samples. Like that previously described (Buntjer et al., 1995), this method is based on the extraction of DNA from meat samples and hybridization to oligonucleotides derived from the abundant, species-specific satellite DNA. These procedures are straightforward and seem quite flexible. Comparable results have been obtained with different procedures of DNA preparation (a rapid alkaline extraction or an enzymatic digestion) and probe detection (direct labeling with alkaline phosphatase or an immunochemical procedure).

Hunt et al. (1997) mention oligonucleotide probes specific for pig, cattle, sheep, goat and rabbit. Buntjer et al. (1995) already specified probes for pig, cattle, sheep + goat, horse, chicken, turkey and deer. In addition (Buntjer, 1997), probes have been developed for roe deer (5′-CCCTCGCTCTCCAATGAAAGC-3′), grey goose (5′-CTGGCACCACTGGGGATGCAG-3′), male cattle (5′-TCAGCCCTGTGCCCTGGYRA-3′), man (as negative control to check aspecific DNA binding, 5′-TCAACTCACAGAGTTGAACGATC-3′) and higher eukaryotes (as positive control of the DNA extraction, $(CA)_{25}$). Probes for Mallard duck (5′-TGAGGGTCACAATGCTGAGG-3′) and Muscovy duck (5′-GAGGCGCAGAATAGAGGCGC-3′) have the correct specificity but have not been validated with meat samples (unpublished results).

Other DNA procedures to check the species origin of meat samples are based on the hybridization to longer, PCR-generated probes (Janssen et al., 1998), on PCR amplification of mitochondrial DNA followed by a species-specific cleavage with a restriction-enzyme (Murray et al., 1995), or on MS-PCR fingerprinting (Buntjer and Lenstra, 1998). All these methods allow the discrimination of closely related species, as chicken vs turkey, and the analysis of processed, even autoclaved samples. Only for samples in which the DNA has been degraded by heating at $>130°C$ or by bacterial decay the protein-based methods may be more effective. Any method is inherently qualitative due to a quite large variation of DNA, protein or antigen content in meat samples (Buntjer et al., 1998). The routine analysis of DNA extracted from meat samples by the Dutch Inspectorate of Health Protection has revealed several cases of species substitution or admixture, either the result of deliberate fraud or caused by inadvertent contamination (Janssen et al., 1998).

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PII: S0308-8146(98)00110-1