



Genetic identification to ensure blockchain-based traceability in beef supply chain



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INTRODUCTION AND OBJECTIVE

Evidence suggests that provenance and traceability, as well as quality characteristics of meat, dictate consumers' meat-purchasing patterns. Here we use **genetic markers** in **blockchain-based traceability** of beef supply chain.

MATERIALS AND METHODS

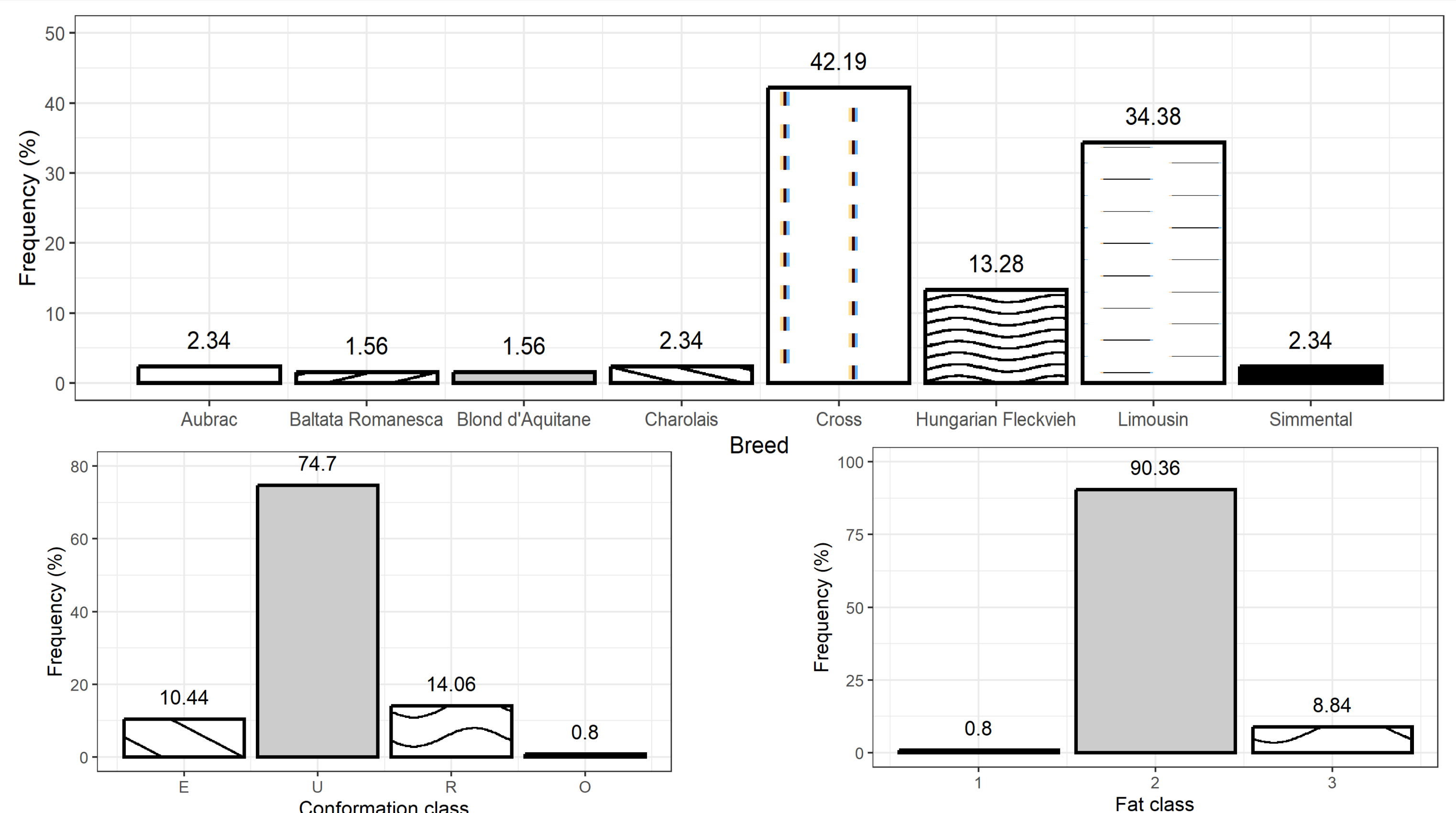
- **Animals and Farms:**
 - 256 beef cattle
 - 2 farms → Central Macedonia, Greece
- **Data collection & Blockchain technology:**
 - Farm, animal & meat traceability data
 - Decoding system using QR-coding → real-time information to consumers
- **Sampling:**
 - Individual animal blood samples → at slaughter
 - Meat samples → at meat processing unit
- **Genotyping:**
 - DNA extraction
 - PCR → 17 microsatellite markers → International Society for Animal Genetics



RESULTS

- **Genotyping & Identification:**
 - Blood and meat sample pairs
 - Correctly assigned (n=256)
- **Traceability data descriptives:**

Trait	N	Mean	SD
Age at slaughter (months)	256	21.3	5.07
Rearing duration in Greece (months)	256	5.9	1.89
Carcass weight (kg)	249	400.1	51.68



CONCLUSIONS

Genetic identification combined with **blockchain technology** can support objectively the **traceability** in the beef supply chain.

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