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RESILTROUT investigates the trout genome to identify marker associated to resilience to diseases and heat stress

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The RESILTROUT project aims to enhance Italian trout farming competitiveness through research and technology integration. Specific objectives include achieving environmentally friendly businesses, selecting resilient trout strains for climate adaptation, implementing water recirculation systems, promoting circular economy practices, reducing pharmaceutical contamination, protect biodiversity, and ensuring fish welfare. Case-control Genome-Wide Association Studies (GWAS) are conducted to investigate traits associated to trout farming economic and environmental sustainability. Two studies focus on identifying genetic markers associated with resistance to two diseases, lactococcosis and Proliferative kidney disease (PKD). This will aid in breeding programs to develop trout strains with enhanced resistance, reducing the reliance on antibiotics and promoting environmental sustainability. Another GWAS targets heat stress resistance, crucial for reducing mortality rates during temperature fluctuations. By comparing genetic variations between cases (dead fish) and controls (surviving fish) under heat stress and/or natural disease challenge conditions, key genetic factors contributing to resilience can be identified. Implementing findings from these studies will enhance the resilience and health of trout populations, contributing to the overall sustainability and competitiveness of Italian aquaculture.

Culling reasons for end of career dairy cows in northern Italy

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Cows may be at the end of their career, and therefore culled, because they are no longer productive but still fertile and healthy (voluntary culling), or because they are lame, injured or sick (involuntary culling). In this study, 7 dairy farms were visited in 2022 to analyse cow culling rates and reasons for culling in northern Italy. Data were related to adult cows (parity≥1) and obtained from the herd management software and through discussions with the farmers. Information collected for each culled cow included parity order, days in milk (DIM), type of exit from the herd (i.e., sale, slaughter, found dead, emergency slaughter (OFES)), and main reason for culling. Results showed variable herd size (average lactating cows=236; min=59, max=586) and milk yield (average 37 kg/day/head; min=32; max=39.7). Out of a total of 1,898 Holstein Friesian adult cows exposed to the risk of culling, 869 (45,8%) were actually culled: 36 (4,1%) for OFES; 54 (6,2%) found dead; 365 (42,0%) sold to another farm; 414 (47,6%) sold for slaughter. Median lactation at culling was 2 (min=1; Q1=1; Q3=3; max=9); median DIM was 126 (min=1; Q1=51; Q3=243; max=1011). The reasons for culling were poor reproductive performance (26.1%), low milk yield (15.8%), high somatic cell count/mastitis (14.7%), unknown reason (12.3%), traumatic injuries (6.0%), udder defects/poor body conformation (5.8%), metabolic/digestive disorders (5.4%), premium prices (4.8%), old age (4.7%), other health issues (4.4%). Health issues and the early age at culling should raise questions about cow welfare, economic sustainability and environmental impact of dairy farming, suggesting areas for improvement to reduce involuntary culling and support a longer, high-quality productive life for cows.