Tail Length and Lesion Sensor:

Developed by Batallé in collaboration with UAB

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

The Tail Length and Lesion Sensor was developed to automatically monitor consequences of tail biting in pig carcasses. Tail biting is a multifactorial damaging behaviour influenced by animal, environmental and management factors, including limited opportunities for exploration and rooting. The consequences of tail biting can be assessed at the slaughterhouse by monitoring both tail lesions and tail length, two important indicators that can provide retrospective information on welfare problems occurring during the production period and support the identification of batches or farms with an increased occurrence of tail-related welfare problems.

The sensor was developed, validated and tested for research purposes in the commercial slaughterhouse involved in Pilot 2.

The Tail Length and Lesion Sensor combines a 3D vision technology installed in the clean area of the slaughter line to capture dorsal images of the rear part of each carcass.



The images are analysed by three Convolutional Neural Networks (CNNs) designed to detect necrosed tails, identify stump tails and classify measurable tails as Short, Medium or Long according to their length (Figure 1).

The three CNN models are integrated into a hierarchical decision pipeline. Images are first assessed for necrosis, followed by stump detection and, for measurable tails, tail-length classification. The pipeline assigns a single final tail-status category to each carcass (Figure 2).

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Models	Category
Necrosed tail detection	**Necrosed**: reddish or blackish discolouration, lacerated skin and partial loss **No lesion**: no evident lesions
Stump tail detection	**Stump**: complete loss of the tail up to the tail base with damaged or healed skin **Measurable tail**: tail that can be measured (≥ 4 cm)
Tail length classification	**Short**: ≥ 4 cm and ≤ 10 cm **Medium**: > 10 cm and < 17 cm **Long**: ≥ 17 cm

Fig.1 - The three models for automatic assessment of tail status

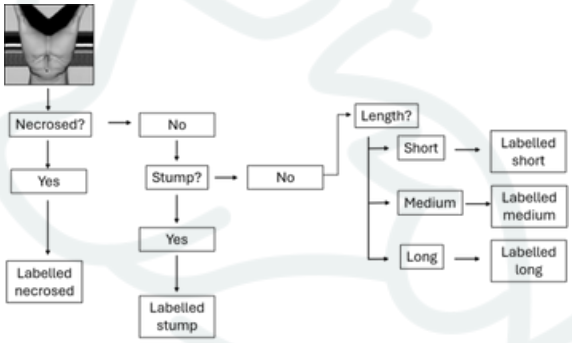


Fig.2 – The three models for automatic assessment of tail status

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