ARTHRITIS INDUCTION IN SUCKLING PIGLETS AND DIAGNOSIS BY
TERMOMGRAPHY IN THE POST WEANING PHASE

Leandro Dalcin CASTILHA*, Ana Carolina Bueno BRAVIN1, Gustavo Henrique de
ARAÚJO1, Leonardo Filipe Malavazi FERREIRA1, Gabriel Amaral ARAÚJO1, Lucas
Pimentel BONAGURIO1, Paulo Cesar POZZA1

*corresponding author: ldcastilha@uem.br
1Universidade Estadual de Maringá, Maringá, Paraná, Brasil

Arthritis is a disease that can affect pigs still in the lactation stage. Contamination occurs
mainly due to extremely rough floors, wet, compacted or slatted, but kept dirty, which
potentiates bacterial contamination. The most affected areas are the joints, which appear
inflamed, swollen and with local fever, causing discomfort to the animals, in addition to
pain, inappetence and even death. With the increasing demand for animal welfare and due
to the damages caused by the delay in the performance of arthritic piglets, it is relevant to
create strategies for rapid diagnosis of joint inflammations in piglets, in order to mitigate
the subsequent effects through prompt treatment. An experiment was conducted with 32
suckling piglets with initial age of 7 days (1.76 ± 0.28 kg BW) to evaluate the use of
thermography during the post-weaning period (7 to 11 kg) as a tool for diagnosis of
induced arthritis in suckling piglets. Animals were divided in two groups: Positive Protocol
(n = 16), consisting of induction of arthritis by 0.1 mL intradermal injection Freund
complete adjuvant (Mycobacterium tuberculosis) at 7, 14 and 21 days of age in the tarsal
phalangeal joint of the right posterior limb; Control Protocol (n = 16), consisting of saline
injection (0.9%). Piglets were weaned at 21 days of age (6.71 ± 1.40 kg BW), and then
housed in a nursery room. During 15 days after weaning, at 3-days intervals, the live
weight, volume of the right hind limb in the tarsal-phalangeal joint of the animals were
measured and recorded, as well as the perimeter and diameter. The protocol used for
arthrosis induction in the lactation phase was effective to manifest the disease in the post-
weaning phase. The surface temperature in the right hind limb of the piglets was recorded
through thermographic images, and resulted (P<0.001) in 33.94 ± 4.03°C for Positive
Protocol, against 29.73 ± 5.46°C of the Control Protocol, representing a variation of
12.40% between both protocols. There were significant correlations between the surface
temperature and the morphological parameters of the piglets’ joint with induced arthritis
after 6 days of post-weaning evaluation. The correlations were 0.667 (P = 0.005) for
perimeter (cm kg⁻¹ BW) and 0.694 (P = 0.049) for diameter (cm kg⁻¹ BW), indicating a
proportional relationship between surface temperature and allometric joint size. Real-time
thermography presents high correlation with the morphological variables, representing an
alternative tool for arthritis diagnose in post-weaning piglets.

Keywords: adjuvant, animal welfare, inflammation