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Effect of metritis on endometrium tissue transcriptome during puerperium in Holstein lactating cows

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1 **Effect of metritis on endometrium tissue transcriptome during puerperium in**
2 **Holstein lactating cows**

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9 **Abstract**

10 The objective of this prospective cohort study was to evaluate the effect of parity and
11 uterine health status postpartum on the gene expression profile of the endometrium
12 early post-partum. Twenty-four Holstein cows were randomly selected (16 multiparous
13 (MP) and 8 primiparous (PP)) and endometrium biopsies were collected on days 1, 3,
14 and 6 after calving and clinically monitored for metritis. Rectal temperature was
15 measured twice and fever was defined as a temperature $\geq 39.5^{\circ}\text{C}$. A case of metritis was
16 diagnosed with the presence of red-brown watery, foul-smelling uterine discharge or a
17 purulent discharge with more than 50% pus and fever between days 1 and 6 postpartum.
18 Cows were then retrospectively selected (cows diagnosed with metritis were paired with
19 healthy ones) to analyze the expression of 66 genes measured on the NanoString
20 nCounter Analysis System. The genes selected were related with adhesion, immune
21 system, steroid and prostaglandin biosynthesis regulation, insulin metabolism and
22 transcription factors, and nutrient transporters. The results indicated a different pattern
23 on genes related to immune function by parity. *PTX3*, involved in antigen presentation,
24 was increased in healthy MP compared with healthy PP whereas inflammatory cytokine
25 *TNF α* and complement-related protein *SERPING1* was upregulated in MP compared

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