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Effect of glycometabolism disorder on follicular growth of dairy cows postpartum based on GC/MS

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The essential factor is follicular growth of dairy cows postpartum to ensure the reproductivity. If the initiation of follicular growth is suffocated, which is called inactive ovary, the reproductivity of dairy cows is hugely influenced. Glycometabolism is one of the main factors to effect on follicular development. There were few reports about metabolism profile of inactive ovary of dairy cows, but the effect of glycometabolism disorder on follicular growth is not clear. In this study, we explored this problem based on GC/MS between dairy cows with healthy and inactive ovary. Plasma samples from twenty-two dairy cows and 20 dairy cows with inactive ovary were selected at 60–90 days postpartum to screen for metabolic compounds using a gas chromatography/mass spectrometry (GC/MS) technique. The data were analyzed with multivariate statistical analysis (MSA) and pathway analysis. One hundred and nine compounds were screened and identified by GC/MS, and 16 compounds with decreased levels in the inactive ovary group were detected via analysis of variables important in projection values and the p values from MSA. Seven compounds are related with glycometabolism including Ribitol, Oxalate, Trehalose, D-Tagatose, methyl-beta-D-galactopyranoside, Hydroxylamine, 5-Aminoimidazole-4-carboxamide ribotide. Meanwhile, 7 pathways involved the glycometabolism, such as pentose and glucuronate interconversions, glyoxylate and dicarboxylate metabolism, starch and sucrose metabolism, galactose metabolism, ABC transporters, nitrogen metabolism, biosynthesis of alkaloids derived from histidine and purine. In summary, it was speculated that glycometabolism disorder effect on the follicular growth induced the inactive ovary in dairy cows postpartum.

Biography

Shi Shu did her PhD in the year 1986, and she is specialized in animal nutrition and metabolic diseases. Her research areas are proteomics, metabolomics, bioinformatics, molecular biology and so on.

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