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2573 High bioavailability of rumen-protected choline alters the vaginal discharge microbiota in dairy cows.

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Rumen-protected choline (RPC) benefits dairy cows' intake, metabolism, lactation, and health. Recently, potential benefits to immune function were also identified. Our objective was to characterize markers of immune function (lipopolysaccharide-binding protein, LBP), acute phase proteins (haptoglobin, HAP), and vaginal discharge microbiota (VDM) as a proxy for uterine immune competence. Holstein cows at 245 d of gestation were blocked by parity within each block randomly assigned to Control or RPC. Cows enrolled in the RPC group received 15 g/d of CholiGEMTM (Kemin Industries Inc.) from 21 d prepartum and 30 g/d from calving to 21 d postpartum. During the transition period, blood was sampled weekly for LBP and HAP analysis. Vaginal discharge samples were collected at the calving and 7 d postpartum to evaluate VDM through 16S rRNA gene sequencing as amplicon sequence variants and data analysis using 4 multivariable in DADA2. Data were analyzed using the GLIMMIX procedure of SAS. There were effects of the week in relation to calving in serum concentrations of haptoglobin in primiparous ($P < 0.01$) and multiparous ($P < 0.01$) cows. However, RPC had no effect on the HAP serum concentration in primiparous ($P = 0.37$) and multiparous ($P = 0.81$). For LBP, there were effects of the week in relation to calving in primiparous ($P = 0.04$) but not in multiparous ($P = 0.52$) cows and RPC had no effect in primiparous ($P = 0.81$) and multiparous ($P = 0.39$) cows. For the VDM, the Shannon index showed lower richness and diversity in the RPC at calving than the Control ($P = 0.04$). Phylum differences between groups were found in multiparous and primiparous by principal coordinate analysis and PERMANOVA ($P < 0.01$). Cows in the RPC group had an altered VDM at genera and phylum at 7 d postpartum with a less relative abundance of Fusobacteriota ($P = 0.03$) and Fusobacterium ($P = 0.02$), a pathogen group associated with metritis in dairy cows. Highbioavailability RPC seems to impact the reproductive tract microbiota suggesting further research on its impact on uterine health warrants further investigation.

KEYWORDS:
Fusobacterium, uterine health, immune system.