

## Mongolian Water Quality Problem and Health of Free-Grazing Sheep

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**Abstract :** Water pollution from animal waste and its influence on grazing animals is a current concern regarding Mongolian grazing lands. We allocated 32 free-grazing lambs to four groups and provided each with water from a different source (upper stream, lower stream, well, and pond) for 49 days. We recorded the amount of water consumed by the lambs, as well as their body weight, behavior, white blood cell count, acute phase (haptoglobin) protein level, and fecal condition. We measured the chemical and biological qualities of the four types of water, and we detected enteropathogenic and enterohemorrhagic *Escherichia coli* in fecal samples by using a genetic approach. Pond water contained high levels of nitrogen and minerals, and well water contained high levels of bacteria. The odor concentration index decreased in order from pond water to upper stream, lower stream, and well. On day 15 of the experiment, the following parameters were the highest in lambs drinking water from the following sources: water intake (pond or lower stream), body weight gain (pond), WBC count (lower stream), haptoglobin concentration (well), and enteropathogenic *E. coli* infection rate (lower stream). Lambs that drank well water spent more time lying down and less time grazing than the others, and lambs that drank pond water spent more time standing and less time lying down. Lambs given upper or lower stream water exhibited more severe diarrhea on day 15 of the experiment than before the experiment. Mongolian sheep seemed to adapt to chemically contaminated water: their productivity benefited the most from pond water, likely owing to its rich mineral content. Lambs that drank lower stream water showed increases in enteropathogenic *E. coli* infection, clinical diarrhea, and WBC count. Lambs that drank well water, which was bacteriologically contaminated, had increased serum acute phase protein levels and poor physical condition; they were thus at increased risk of negative health and production effects.

**Keywords :** DNA, *Escherichia coli*, fecal sample, lower stream, well water

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