One Health Module / One Health Ally Course
Submodule 4 One Health on-site Training
報告書 Report

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活動報告 [Activity Report]

タイトル [Course Title]	モンゴルにおける食品媒介感染症と薬剤耐性菌の調査研究
実施期間 [Periods]	2024年6月2日-6月12日
共同実施者 [Other participants]	JAYAWEERA MUHANDIRAMGE Sasini Jayaweera BULGAN Erdenebat DO Thanh Thom
言語 [Language]	English
実施場所 [Location]	モンゴル生命科学大学他

この活動に参加した理由（200字程度）[The reason why you participated in this activity (around 120words)]

Mongolian livestock numbers reached 64.7 million head in 2023. Most of the livestock (99.2%) are owned by herders engaged in traditional extensive grazing. A major challenge in Mongolia is the scarcity of scientific data on critical public health issues such as brucellosis, campylobacteriosis, enterohemorrhagic E. coli infections. This lack of data hinders the development of effective control measures and public health interventions. My major is health sciences, and I have an interest in the human health issues faced by other countries. This opportunity allowed me to enhance the concept of interdisciplinary collaboration and contribute to a global understanding of these public health challenges.

実施内容（2ページ程度、写真・図表含む）
[Activities details (up to 2 pages providing photos, figures, and tables)]

[Sampling]

Fecal and milk samples required for this study were collected from nomadic and dairy farms around Ulaanbaatar, as detailed in **Table. 1**.

Table. 1. Samples information

Animals	Types	Farm	Number
Sheep	feces	A	10
	feces	B	10
	milk	A/B	10
Goat	feces	A	10

	feces	B	10
	milk	A/B	10
	feces	A	11
Cattle	feces	B	10
	milk	A/B	10

[Laboratory works]

1. Brucella ring test

The Brucella ring test was conducted on milk samples. By mixing milk with Brucella antigen, vortexed, and incubated them at 37°C for one hour. The results showed that all milk samples tested negative for Brucella as **Fig. 1**.

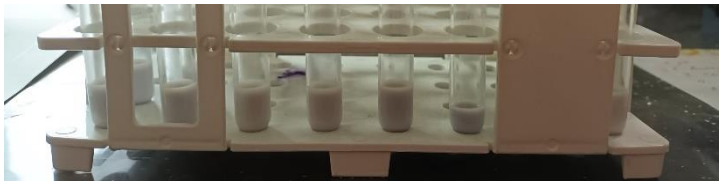

Fig. 1. Brucella ring test

2. Antimicrobial resistance test

Spread samples onto three types of Chrom agar ECC—one without antibiotics, one with 1 µg/mL ciprofloxacin (CPF), and one with 1 µg/mL cefotaxime (CTX). The plates were incubated at 37°C for 20-24 hours (incubation plates shown in **Fig. 2**). Samples were collected from sheep, goats, and cattle across different farms. Out of the tested samples, only two (one cattle sample with CPF and one cattle sample with CTX) tested positive on antibiotic agar as **Table. 2**, indicating the presence of antibiotic-resistant bacteria. These results suggest that while antibiotic resistance was not widespread among the samples, specific instances of resistance were identified, highlighting the importance of ongoing surveillance and targeted interventions.

Fig. 2. AMR incubation

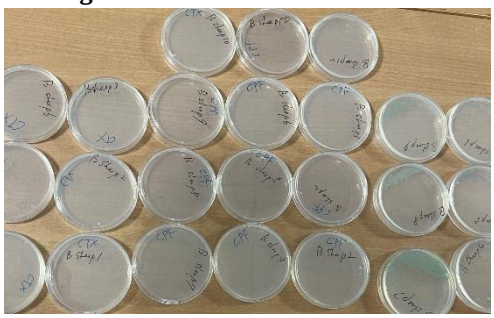

Table. 2. Antimicrobial resistance result

Animals	Types (farm)	ECC	ECC+CPF	ECC+CTX
Sheep	feces (A)	10	0	0
Sheep	feces (B)	10	0	0
Goat	feces (A)	10	0	0
Goat	feces (B)	10	0	0
Cattle	feces (A)	10	1	0
Cattle	feces (B)	9	0	1

3. EHEC isolation

The samples were inoculated onto both CT-MacConkey and CHROMagar STEC plates and incubated at 37°C for 24 hours. The results, as depicted below (**Fig. 3** and **Table. 3**), indicate that 30% of the samples tested positive for EHEC. This finding underscores the importance of using specialized agars for the effective differentiation and identification of EHEC strains.

Fig. 3. EHEC isolation

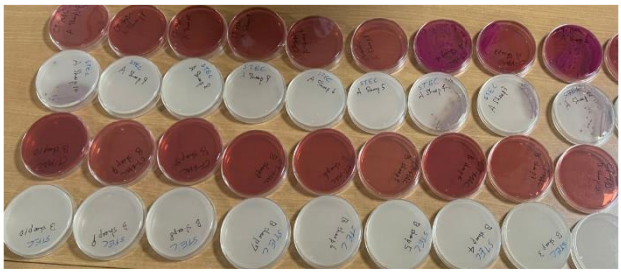

Table. 2. EHEC isolation result

Animals	Types (farm)	CT-MacConkey	STEC
Sheep	feces (A)	4	4
Sheep	feces (B)	0	0
Goat	feces (A)	5	5
Goat	feces (B)	2	2
Cattle	feces (A)	9	4
Cattle	feces (B)	9	5

[Social activities]

We had the opportunity to visit several prominent research institutions and international organizations, including the JICA Mongolia Office, FAO Mongolia Office, National Center for Communicable Diseases (NCCD), and the Institute of Veterinary Medicine (IVM) as **Fig. 4**. During our visits, we engaged in discussions on a variety of topics, such as public health, animal health, antimicrobial resistance, and international cooperation. Moreover, we were fortunate to tour the laboratories at NCCD and IVM, where we observed their advanced equipment and learned about their ongoing research projects. These interactions significantly enhanced our understanding of laboratory operations and the practical applications of these technologies in Mongolia.

Fig. 4. Visit to JICA Mongolia Office, FAO Mongolia Office, NCCD and IVM

[Field trip]

We visited Hustai National Park, renowned for its successful reintroduction of the ancient horse species, the Takhi. The park's diverse ecosystem, teeming with numerous plant and animal species, underscores the importance of maintaining ecological balance. During our visit, we observed many Tarbagan marmots and were fortunate enough to spot the Takhi (**Fig. 5**). This experience not only allowed us to witness these rare species up close but also profoundly highlighted the critical significance of biodiversity conservation and the preservation of ecosystem equilibrium.

Fig. 5. Observation of Takhi and Tarbagan marmot

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今回の活動経験が、今後のOne Healthに関連した活動、国際共同研究、国際協力、国際連携等に与える影響（500字程度）[Impact of the experience on future One Health activities, international collaborative research, international cooperation, international collaboration, etc. (around 300 words)]
Through this investigation of foodborne pathogens in Mongolia, and our visits and exchanges with relevant institutions (JICA Mongolia Office, FAO Mongolia Office, NCCD and IVM), I have gained a deeper understanding of how regional health security requires coordinated efforts across multiple sectors. The close collaboration between the Veterinary School of Mongolia, the Veterinary School of Hokkaido University, and JICA has facilitated extensive knowledge and skill exchanges. This collaboration has not only enhanced the technical capacities of Mongolian partners but also provided us with insights into local health challenges and practices. This reciprocal capacity building is critical for fostering sustainable health initiatives that are locally adapted and globally informed. This experience has given me renewed insights and inspiration regarding interdisciplinary, international, and multi-sectoral research. We are not currently in a sustainable development environment, global temperatures are rising annually, resource scarcity is becoming more apparent, and the continuous spread of infectious diseases poses a threat to human health. In addition to foodborne diseases, infections such as AIDS continue to spread. Some diseases, even with available vaccines like rabies, are still prevalent in many countries despite being eradicated in places like Japan for decades. Moving forward, we must promote the concept of "One Health" to strive for optimal health outcomes at regional, national, and global levels.
備考 [Remarks]

※ 報告書を作成後、担当教員に確認をお願いし署名をもらってください。PDFファイルとしてVetlog上の提出書類「Student Free Design Activities報告書」としてアップロードして下さい。

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