



Title	OBSERVATIONS OF RUMINAL MOTILITY AND THORACIC MOVEMENT WITH ARTIFICIAL RETICULO-DIAPHRAGMATIC ADHESIONS IN SHEEP
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Citation	Japanese Journal of Veterinary Research, 13(2), 58-59
Issue Date	1965-06
Doc URL	<a href="http://hdl.handle.net/2115/1815">http://hdl.handle.net/2115/1815</a>
Type	bulletin (article)
File Information	KJ00002369141.pdf



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the survival of adults. When the extract was added, more than 70% of the worms survived for 40 days (the maximum 53 days). The worms in such media were active and laid eggs for the first 40 days, although, except in the beginning, the eggs were generally abnormal and unfertilized. Raw horse liver extract did not affect the survival. The dialyzable fraction of heat- and autoclave-treated horse liver extract was not destroyed by heating for 10 minutes at 100°C or by autoclaving, and this fraction contained some factor which prolonged the survival of adult females. Various water soluble vitamins appeared to have no effect on survival.

Histochemical examination of surviving worms in media with heat- and autoclave-treated liver extract usually disclosed glycogen in various portions and large quantities of acid phosphatase in the intestinal cells.

The best medium for the adult *S. vulgaris* was composed of HANKS' balanced salt solution, horse serum and 50 volume % heat- and autoclave-treated horse liver extract in proportions of 4.5 : 4.5 : 1. With the larvae good results were obtained with HANKS' balanced salt solution with 50 volume % horse serum.

Thesis for the Masters degree

**OBSERVATIONS OF RUMINAL MOTILITY AND THORACIC  
MOVEMENT WITH ARTIFICIAL  
RETICULO-DIAPHRAGMATIC ADHESIONS IN SHEEP**

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(Summary of Master's thesis written under direction of Dr. T. SAKAI)

A non-surgical method of recording ruminal motility was attempted in sheep. In five of the cases reticulo-diaphragmatic adhesions were formed, and in one a permanent fistula was formed in the reticulum.

1) Simultaneous wave patterns made by the internal and external recording devices were very similar in the sheep with the permanent fistula.

2) Recording of thoracic movement always showed a large, high amplitude wave (r-wave) in conjunction with regurgitation, and a characteristic wave (e-wave) in conjunction with eructation.

3) The difference between the ordinary ruminal movement (O-wave, generally called primary contraction) and the eructation movement (E-wave, generally called secondary contraction) could be clearly distinguished.

4) The motility cycle of the O-wave in sheep with surgical adhesions decreased by 8.5 seconds in the ruminating period and by 3.3 seconds in non-ruminating period.

5) Comparison of records made prior to the adhesions and those made one month after adhesions had formed showed that the mean value for the duration of the O-wave decreased by 1.1 seconds in the ruminating period and by 1.6 seconds in the non-ruminating period.

6) One month after the adhesions were formed, frequencies of the E-wave had decreased from 8.0 to 7.0 times per ten minutes in the ruminating period, and from 8.6 to 5.0 times per ten minutes in the non-ruminating period.

7) Comparison of records made prior to the adhesions and those made one month after adhesions had formed showed that the mean value for the duration of the E-wave had decreased by 1.1 seconds in the ruminating period and increased by 0.4 seconds in the non-ruminating period.

8) One month after adhesions had formed, the amplitude of the upward spike of the r-wave was reduced to 23.8% of its pre-adhesion amplitude and the wave form was changed from a diphasic to a monophasic pattern.

## **STUDY OF HUMORAL ANTITOXOPLASMIC FACTORS IN THE NEUTRALIZATION TEST**

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(Summary of Master's thesis written under direction of Dr. S. MIURA)

SABIN et al. proved that the infectivity of toxoplasms is neutralized by a combination of two serum factors, thermostable specific antibodies and thermolabile nonspecific substances. However, because of their complexity, little is known about these factors or the mechanism of neutralization.

The present study was undertaken to determine the humoral antitoxoplasmic factors required to neutralize the mouse killing activity of the parasites. For this purpose, mice were inoculated either intraperitoneally or subcutaneously with the parasites treated with both inactivated toxoplasma immune rabbit serum and unheated serum from one of several animals. The results of this study may be briefly summarized as follows.

1) The mouse killing activity of the toxoplasms was not completely neutralized by the inactivated immune rabbit serum alone.