saturate some cotton swabs with the blood and place them in a tight leak-proof container. Some instrument should be used to hold the cotton swabs. A pair of pliers is handy and can be held in a flame or placed in concentrated formalin after use.

If an animal is suspected of being poisoned send some stomach contents, some intestinal contents and a portion of the liver. If the animal has vomited some of this material is very satisfactory as it usually contains the poison.

The container in which the tissues have been placed should then be packed in a box so that there is no danger of breaking it. Label—"Glass" and "Perishable" and attach the "history" to it. If the material is sent by parcel post a three cent stamp should be placed on the envelope containing the history.

If one desires to send droppings for the diagnosis of parasites or mastitis or other special types of diagnosis he should write to the Veterinary Department, NDAC, Fargo, for specific instructions.

These directions are offered for the use of those seeking diagnostic service in order that it will be possible in more cases to make a diagnosis on the material submitted.

FISH AND MILK PROTEINS ARE A GOOD SUPPLEMENT TO PEA MEAL PROTEIN IN A RATION FOR YOUNG GROWING CHICKS

A Review

D. W. Bolin, Associate Nutritionist, Department of Animal and Human Nutrition, is the senior author of a paper entitled "Chick Growth Response Resulting from Methionine Additions to Various Protein Supplements with Pea Protein." The paper, published in Poultry Science, Volume XXV, No. 2, March 1946 as a contribution from the Departments of Agricultural Chemistry and Poultry Husbandry, University of Idaho, Moscow, is under the authorship of D. W. Bolin, Charlie F. Petersen, C. E. Lampman, and Olaf E. Stamberg. Mr. Bolin joined the staff of the North Dakota Agricultural Experiment Station on July 1, 1945.

The above authors in a previous publication have shown, that pea proteins are methionine deficient for chick growth. Methionine is an essential amino acid, the addition of this amino acid to pea protein increased markedly the growth rate of the young chick. In view of these findings, different protein supplements, such as fish meal, dried milk, meat meal, soybean oilmeal and cereal proteins were, each added separately to a ration containing 54.5 per cent ground peas or 12 per cent pea protein. Chicks one week old were placed on these rations for two weeks. In addition, chicks were also placed on the same rations to which 0.25 per cent methionine was added.

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cows it should be based on a knowledge of the kind of bacteria present and should be followed up with repeated tests and treatment until the disease is cured.

In those herds where there are numerous cases of mastitis it is frequently the best policy to treat the animals during the periods when they are dry and to use the drug most effective against the organism causing the disease.

Much of the loss due to mastitis can be prevented by improved methods of husbandry. Dairy barn sanitation, control of flies, washing the udders, clean utensils, and proper milking will all tend to decrease the cases of mastitis. There can be no control of this disease unless the dairyman makes use of the laboratory examination of the milk for diagnosis and then uses the proper drug to cure the case and removes those predisposing factors which originally caused the disease.

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Some of the results of these feeding experiments are summarized in the following table.

Average net gain of chicks in grams on pea protein ration, with different protein supplements, with and without Methionine.

Fish Meal	Dried Milk	Meat Meal	Soybean oilmeal	Oat groats	Wheat bran	Ground wheat
			No Methionine added			
76.6	73.9	21.7	47.8	35.2	42.5	41.4
			Methionine added			
101.8	89.9	100.4	105.6	86.5	94.6	101.0
			Per cent increase in gain from the addition of Methionine			
32.3	21.6	362.7	120.9	145.7	122.6	144.0

Only a small percentage increase resulted from the addition of methionine to milk and fish supplements, indicating that milk and fish are a good source of methionine. The large percentage increase indicates meat meal to be a poor source of methionine, and poor supplement to pea protein. Soybean oilmeal, oat groats and wheat proteins were found to be a fair source of methionine.

The results of these experiments indicate that if large quantities of pea proteins are used as a protein supplement in poultry rations for young growing chicks, fish or milk protein should also be included in the ration as a source of methionine to supplement the pea protein. Free access to skim milk would be an excellent supplement to a ration containing peas for the young chick. (Reviewed by D. W. Bolin.)