LETTERS TO THE EDITOR

An Epizootic of Swine Influenza in Quebec

DEAR SIR:

Swine influenza is known as an acute respiratory disease of swine, characterized by a sudden onset of coughing, dyspnea, prostration and fever. Rapid recovery from the disease is characteristic and a type A influenza virus is involved (1). We would like to report the observations we have made on a severe epizootic of swine influenza which has occurred in the Saint-Hyacinthe area during late January and February 1981. Similar outbreaks have also been reported from almost all the regions of the province.

The disease appeared almost simultaneously on many farms located several kilometers apart. The problem was important mainly in the feeder swine operations, but some maternities and farrow-to-finish operations were also affected. The main complaint of owners was the sudden onset of acute respiratory signs spreading rapidly among swine of all ages in the farm. In some herds, 70% to 80% of the pigs were sick within two or three days. A paroxysmal cough was the principal sign reported and several of the affected animals had labored breathing. Complete anorexia, rapid loss of weight and fever up to 41°C were common observations. In some herds the pigs were prostrated, lying down and very reluctant to move. The mortality rates were low or absent in cases brought to our attention. Several practitioners reported that the pigs were sick for five to seven days and then recovered rapidly.

Several affected pigs of different ages, submitted alive for necropsy, had essentially similar lung lesions. The cranial, intermediate and accessory lobes and the lower half of the caudal lobes were usually involved. The pneumonic tissue was slightly atelectatic, consolidated, grayish or plum-red and the color varied sometimes from one lobule to another. There was a sharp demarcation between normal and abnormal lung tissue. A clear serous fluid exuded from the cut surfaces of the affected lobes, interlobular edema was common and copious amounts of a white mucopurulent exudate filled the large and small bronchi. In several of the affected lobes, the small bronchi and bronchioles were accentuated. The mediastinal and bronchial lymph nodes were enlarged, edematous and frequently hyperemic.

Microscopically, the most prominent lesions were an acute bronchitis and bronchiolitis and a serocellular alveolar reaction. The bronchi were filled with an exudate composed mainly of mucus and neutrophils. Several bronchioles were plugged by neutrophils, cellular debris and few macrophages. Focal to complete necrosis of the bronchial and bronchiolar epithelium was common; signs of regeneration were also evident and characterized by the presence of one or several layers of hypertrophic and hyperchromatic epithelial cells lining the bronchi and bronchioles. Infiltrations of mononuclear cells into and around the walls of small bronchi, bronchioles and small blood vessels were observed in several of the affected lungs. The alveoli were flooded by various amounts of serocellular exudate. The cellular portion of the exudate was composed of alveolar macrophages and neutrophils. Thickening of the alveolar walls by edema and/or mononuclear cells was a common but not a consistent finding.

An influenza virus was recovered from most of the pneumonic lungs submitted for virological examinations; they were from pigs from eight different farms. The virus was isolated by intraallantoic inoculation of embryonated hen's eggs and demonstration of hemagglutinin in the allantoic fluids (1). The virus was visualized by direct electron microscopic examination of allantoic fluids by negative staining. Hemagglutination-inhibition tests using known antisera have revealed that at least six of our isolates were antigenically similar to the A/Swine/ Wisconsin/49/76 strain.

Bacteriological examinations were performed on these lungs. *Pasteurella multocida* was isolated from some of them and *Haemophilus pleuropneumoniae* was an occasional finding.

The clinical signs, gross and microscopic lesions observed in this epizootic of respiratory problems are compatible with those reported for swine influenza (1,4,5,6). The isolation of swine influenza virus in several affected herds has confirmed the diagnosis. The gross lesions in the lungs of the affected pigs were similar to those seen in severe cases of enzootic pneumonia (3). Microscopically, an acute bronchitis and bronchiolitis with extensive necrosis and regeneration of the lining epithelium was the most typical lesion.

The fact that the disease has started almost simultaneously on several unrelated farms located several kilometers apart is very interesting. This phenomenon, well known in midwestern United States (1), would suggest that the virus was present in several farms before the outbreaks began. A serological survey made throughout the province in 1971 had revealed that 18.1% of the 105 swine herds tested had antibodies for A/Swine/Manitoba, 13.3% for A/Swine/Wisconsin, 11.4% for A/Swine/31 and 6.7% for A/Swine/Taiwan (2). At that time, the infection seemed to be asymptomatic. If the hypothesis of widespread asymptomatic infection is true, there should be a common factor which has favored the appearance of these outbreaks. In early January, the weather was unusually cold for three weeks and consequently several farms have experienced severe problems in controlling temperature and humidity levels. Inclement, cold weather is known as an important predisposing factor for the appearance of epizootics of swine influenza (1). The possibility that spreading of the virus from acutely affected to uninfected herds might have been responsible for some outbreaks should not be discarded.

Swine influenza was reported in Manitoba in 1967 where it seemed limited to a Record of Performance (R.O.P.) station (7). The present epizootic was much more widespread and is the first one recognized in eastern Canada.

Sincerely yours,

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Transmission and Treatment of *Muellerius capillaris* in Goats

DEAR SIR:

The growing population of goats in Ontario is reflected by the increasing number of submissions of fecal samples for diagnosis and of animals for necropsy. Between 1974 and 1978 the total number of samples and animals sent to the Ontario Ministry of Agriculture and Food increased over four-fold (from 220 to 903). During the same period at the Ontario Veterinary College, the number of goats examined at necropsy has doubled. A large number of the latter group had a history of respiratory problems with a high prevalence of the lungworm *Muellerius capillaris* (Müller) recorded.

Numerous molluscs have been reported as intermediate hosts for *M. capillaris* (2,3,4,5) and the slug *Deroceras laeve* (Müller) (1) is readily infected experimentally (McCraw, unpublished data). *Deroceras* is widespread in southern Ontario and has been identified on several farms raising goats. It is active up to the time near-freezing or freezing temperatures are attained, permitting transmission of this lungworm to goats allowed outdoors until possibly mid-November. Goats raised in isolation and infected with *M. capillaris* have been found to pass first stage larvae in feces for many months (McCraw, unpublished data). It is therefore possible for new broods of molluscs the following spring to be exposed to first stage larvae derived from an infection acquired the previous summer or fall. After penetration of the mollusc, these larvae develop to infective (third stage) larvae and accidental ingestion of the mollusc by kids or goats results in a patent infection. From an analysis of goats submitted for necropsy at the Ontario Veterinary College, some of the heaviest infections of this lungworm have been found in older goats — up to nine years of age — suggesting that repeated reinfection may occur.

Recently, on a farm in southwestern Ontario, 27 adult goats with a history of coughing were examined for *Muellerius* and 21 were found to be infected. Ten of the most heavily infected were selected for treatment with fenbendazole.[1] Each was treated with 4.5 mL of a 10% suspension (450 mg) *per os* for three days at 48 hour intervals. All ten goats, examined four, 14, 28 and 59 days after the last treatment, were found to be negative for *Muellerius* by fecal Baermann preparation. Following treatment the owner reported that coughing regressed.

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[1]Panacur® (10% suspension), Hoechst Canada Inc., Pharmaceutical Division, Montreal, Quebec.