Pneumonia in East-Friesian lambs and crosses in Israel

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Summary: Pure-bred East-Friesian (E.F.) lambs, reared indoors in Israel, showed a 50% mortality rate, which was significantly higher than pure Awassi and E.F. × Awassi crosses in the same conditions.

The main P.M. finding was interstitial pneumonia; the main bacteriological findings were Pasteurella haemolytica and P. multocida. Mortality could be significantly reduced by minimizing physical contact between progeny and dams and among progeny.

A zootechnical approach to disease prevention in susceptible breeds is discussed.

INTRODUCTION

The pneumonia complex in lambs is a multiple infection induced by exposure to various agents such as viruses, mycoplasma, chlamydia and bacteria, and subsequent stress factors. It has proven to be a major health problem in Israel concerning the breeding of East-Friesian sheep and their crosses with local Awassi sheep.

Since 1956, experiments have been carried out in Israel aiming at the development of a breed based upon crosses between the indigenous fat-tailed triple-purpose Awassi sheep and the East-Friesian (E.F.) milk sheep. The main purpose of the experiments was to improve the productive capacity of the Awassi sheep by achieving higher twinning percentage and earlier maturity, while maintaining the high level of milk production. The aims have been partly achieved, and have contributed to the new Assaf breed (1, 2).

EPIDEMIOLOGY

E.F. female hoggets and rams were brought to Israel from Germany in two consignments during the years 1956 and 1963. They were introduced into the experimental station Neve Yaar in the Yizre’el Valley in northern Israel (32° 45’ N, 35° 12’ E) with average maximum and minimum daily temperatures

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in August of 34° and 19.8°C, respectively, and in January of 17.6° and 7.8°C, respectively; annual rainfall in the area is 560 mm.

The lambs of E.F., Awassi and Assaf breeds were reared under housed conditions until the age of 6 months; they were weaned at the age of 60-90 days. It soon became evident that a very high mortality rate was prevalent in the E.F. lambs. During a 4-year observation period, 54% (122/188) lambs died, most of them at the age of 2-5 months after a very short clinical phase, compared to 11.6% (20/172) in Awassi lambs and 11.7% (99/845) in crossbred lambs (Assaf). Three outstanding syndromes were noticed: pneumonia in lambs 1-6 months old, urolithiasis in male lambs 2-5 months of age, and acute jaundice in hoggets 7-10 months old.

Acute pneumonia, characterized by extensive changes in the lungs involving the apical, cardiac and intermediate lobes, pleuritis and by fatty liver degeneration was found in ca. 64% of the dead E.F. lambs.

Bacteriological examinations, carried out by the Kimron Veterinary Institute in 105 lambs throughout the observation, disclosed the following findings: *Pasteurella haemolytica* 36; *Pasteurella multocida* 29; *Mycoplasma spp.* 15; Chlamydia 10; coliform bacteria 8; others 7; no bacteriological finding 21. Out of 12 lambs serologically tested for parainfluenza 3 virus, 7 were found positive. Atypical interstitial pneumonia with lymphocytic perivascular and peribronchial cuffing, were consistent in many histological examinations carried out by the Department of Pathology, Kimron Veterinary Institute, and resembled findings made in Scotland (3).

Various attempts at preventive and therapeutic treatment with various antibiotics were unsuccessful.

Based upon the information that E.F. sheep are kept in their homeland (North Germany and Holland) in very small units, and the assumption that their grouping might contribute to stress and pneumonia (3), it was decided to try a zootechnical approach concerning this disease entity in the Neve Yaar experimental station.

**EXPERIMENTAL OBSERVATIONS**

Experiments were carried out over two consecutive years.

**First experiment.**

Twenty E.F. ewes were put after parturition in individual pens on wooden slats, each 1.10 m² in size. The progeny of each ewe, totalling 41 lambs, were placed in other pens, and introduced to their dams twice daily for suckling until weaning at the age of 3 months.
Another group of 12 ewes were kept all the time in a common flock with their progeny, totalling 22 lambs, on straw bedding. The results were as follows:

<table>
<thead>
<tr>
<th>Rearing system</th>
<th>No. of lambs</th>
<th>Dead with pneumonia</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pens</td>
<td>41</td>
<td>5</td>
<td>12%</td>
</tr>
<tr>
<td>Group</td>
<td>22</td>
<td>7</td>
<td>32%</td>
</tr>
</tbody>
</table>

**Second experiment.**

To rule out possible hereditary factors, a second experimental observation was planned and carried out, comprising 15 pairs of E.F. twin lambs and 13 single lambs. 15 twinning E.F. ewes were put after parturition in individual pens as described above. Of each pair of twins, one randomly selected lamb was put in an individual pen (group A); his/her mate — in a common group (group B). Both were introduced to their dam twice daily for suckling, until weaning at 3 months of age.

13 single lambs were kept throughout the observation together with their dams in a common pen (group C). The results were as follows:

<table>
<thead>
<tr>
<th>Rearing system</th>
<th>No. of lambs</th>
<th>Dead with pneumonia</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>15</td>
<td>2</td>
<td>13%</td>
</tr>
<tr>
<td>B</td>
<td>15</td>
<td>5</td>
<td>33%</td>
</tr>
<tr>
<td>C</td>
<td>13</td>
<td>7</td>
<td>54%</td>
</tr>
</tbody>
</table>

**Conclusions.**

In both observations, lower infection and mortality rates were recorded in E.F. lambs that had less direct contact with other animals. The most severely affected group in the second observation was group C, in spite of the fact that it consisted of single lambs — which are usually considered to have lower mortality rates than twins.

Although the number of animals in both observations was relatively small, it seems that restriction of direct contact between progeny and adult animals, and probably between the lambs, contributed to reduction of infection and mortality rates, without any other treatment.
DISCUSSION

After termination of the initial steps to breed and select the Assaf sheep, pure-bred E.F. sheep are no more bred in Israel. Pneumonia rate in Assaf lambs is only slightly higher than in local Awassi lambs. However, it is contemplated to continue the observation in this respect, and preliminary experiments of crossing the Assaf sheep with Chios sheep, which are milk sheep imported for this purpose from Cyprus, have been carried out. In those preliminary observations, no significantly different mortality figures between the three breeds were found, but pneumatic changes in the lungs, examined in Assaf, Chios and Assaf × Chios F1 lambs after slaughter, were clearly more pronounced in Assaf lambs than in the other two groups.

It might be concluded that in relation to multifactorial syndromes such as the pneumonia complex in lambs, conservative preventive and therapeutic methods could be assisted by a zootechnical approach, such as crossing with local or resistant breeds, and selection, combined with modified husbandry. It is not striking to observe that close contact with older animals, and crowding, might enhance infections, but in addition to that, ethological factors should be borne in mind. It could be interesting to examine the hypothesis that certain breeds of sheep, such as the East-Friesians, are stressed if kept in larger groups.

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LA PNEUMONIE CHEZ LES AGNEAUX DE RACE EST-FRISONNE PURE ET CROISÉS EN ISRAËL. — A. Shimshony.

Résumé : Les agneaux de race pure est-frisonne (E.F.) élevés en bergerie en Israël, ont présenté un taux de mortalité de 50%, significativement plus élevé que celui observé chez les agneaux Awassi de race pure et les croisés E.F. × Awassi élevés dans les mêmes conditions.

A l'autopsie, on a observé surtout de la pneumonie interstitielle. Les germes les plus fréquemment isolés sont Pasteurella haemolytica et P. multocida. Il a été possible de réduire de façon significative la mortalité en évitant les contacts physiques entre les nouveau-nés et leurs mères, et entre les nouveau-nés eux-mêmes.

L'auteur envisage dans la discussion une approche zootechnique pour prévenir la maladie dans les races sensibles.

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LA NEUMONÍA EN LOS CORDEROS DE RAZA ESTE-FRISONA PURA Y CRUZADOS EN ISRAEL — A. Shimshony.

Resumen : Los corderos de raza pura este-frisona (E.F.) criados en aprisco en Israel, presentaron una tasa de mortalidad del 50%, signifi-
cativamente más alta que la observada en los corderos Awassi de raza pura y los cruzados E.F. × Awassi criados en iguales condiciones.

En la autopsia, se observó principalmente neumonía intersticial. Los gérmenes más a menudo aislados son Pasteurella haemolytica y P. multocida. Se pudo reducir de modo significativo la mortalidad evitando los contactos físicos entre los recién nacidos y sus madres, y entre los propios recién nacidos.

El autor contempla en la discusión un enfoque zootécnico para prevenir la enfermedad en las razas sensibles.

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REFERENCES


