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# MYCOPLASMA IN SLUGHTERED CATTLE

By

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## SUMMARY

Four hundreds samples of lung, liver, muscle and synovia were collected from 100 slaughtered Friesian and buffaloe calves (50 of each) examined for the prevalence of mycoplasma infection. The PH of examined samples was measured.

35 isolates of mycoplasma were isoalted and identified as M. bovigenitalium (16), M. arginini (11), M. bovis (7) and M. alkalescens (once). Most of isolates were recovered from Friesian calves, while buffaloes seems to be more resistant.

The average PH values were 5.66, 6.73, 6.33, 7.68 in examined buffaloes muscle, lung, liver and synovia samples and 5.66, 6.61, 6.29, 7.67 in Friesian calves samples respectively. Slight elevation of PH value was recorded in mycoplasma positive samples.

The hygienic significance of isoalted microorganisms was discussed.

## INTRODUCTION

Mycoplasma constitute special hazards for cattle in Egypt. It could be isolated from the domesticated ruminants having a variety of clinical disorders such as mastitis (Jasper, 1977; Boughton, 1979 and Gibbs & Allan, 1986); arthritis (Singh et al., 1971; Hjerpe & Knight, 1972 and Shadrina & Korner, 1986); pneumonia (Jurmanova & Krejei, 1971; Langford, 1977 and Allan et al., 1978) and orchitis (Parsonson et al., 1974 and Sood et al., 1986).

The economic effects of Mycoplasmosis among food animals illustrated by sudden and dramatic drop of milk production, high morbidity among stock and failure to respond well to antimicrobial therapy.

The current study was planned to throw light on the prevalence of mycoplasma among slaughtered Friesian and buffaloes calves while suffering from swollen joints and its possible effect on the PH of produced meat.

## MATERIALS AND METHODS

### Samples:

Four hundreds samples of lung, liver, gracillius muscle and synovial fluid (Carbal joint) were collected from 100 Friesian and buffaloe calves slaughtered at Cairo abattoir.

### Isolation of Mycoplasma:

The technique recommended by Razin and Tully (1985) was used. Each of the collected samples was enriched and plated on Hayflich's broth and agar medium. Plates were incubated at 37°C in moist candle jar for 48 hours up to 7 days.

Suspected colonies were identified microscopically by their characteristic "Fried egg"- shape, biochemically using Arginine deamination, Dextrose fermentation and Tetrazolium reduction tests and serologically using specific antisera produced by Mycoplasma Research Section, Animal Health Ressearch Institute, Dokki, Egypt.

### Measurement of PH:

The PH value was determined by PH meter after 2 hours from taking the synovial fluid and after 24 hours refrigeration of the other tissue samples.

## RESULTS AND DISCUSSION

Mycoplasma species are parasites of the mucous membranes and joints (Krieg and Holt, 1984). They appear to have aetiological significance in many diseases of respiratory and urogenital tracts.

In the present study, 400 samples from synovia of swollen joints, lung, liver and gracillius muscles of 100 slaughered Friesian and buffaloe calves (50 each)were examined for the prevalence of mycoplasma infection, its role in joints sweeling as well as its effects on PH of meat and organs.

From the recorded results in Table (1), 35 isoaltes of mycoplasma could be isolated from all examined samples (8.75 %). Most of isolates were recovered from Friesian calves and only 9 isolates were detected from buffaloe calves which seem to be more resistant to bovine mycoplasma pathogens.

**Table (1): Prevalence of mycoplasma among examined buffaloe and Friesian calves.**

| Mycoplasma | Buffaloe | Friesian | Total |
|---|---|---|---|
| M. arginini | 6 | 5 | 11 |
| M. alkalescens | - | 1 | 1 |
| M. bovis | 1 | 6 | 7 |
| M. bovigenitalium | 2 | 14 | 16 |
| Total | 9 | 26 | 35 |

M. bovigenitalium constitutes the most prevalent species (16 isolates) identified. Two isolates were detected from lung and synovia of buffales, while most of the remainder were detected in Friesian liver and synovial samples (Table 2).

Moreover, 11 isolates of M. arginini were isolated, among which 3 strains were detected in each of the examined buffaloe's lung and synovia samples.

Mycoplasma fail to be detected in muscles and liver samples derived from buffaloe calves. On the other hand, two strains of M. arginini and M. bovigenitalium were detected from Friesian calves muscle samples and 8 isolates, 5 of them were identified as M. bovigenitalium, 2 M. arginini and one M. alkalescens, were detected in liver samples.

**Table (2): Mycoplasma isolated from organs and tissues of examined animals.**

| Isolates | Muscles | | Lung | | Liver | | Synovia | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | F | B | F | B | F | B | F | B | |
| M. arginini | 1 | - | 1 | 3 | 2 | - | 1 | 3 | 11 |
| M. alkalescens | - | - | - | - | 1 | - | - | - | 1 |
| M. bovis | - | - | 2 | - | - | - | 4 | 1 | 7 |
| M. bovigenitalium | 1 | - | 1 | 1 | 5 | - | 7 | 1 | 16 |
| Total | 2 | - | 4 | 4 | 8 | - | 12 | 5 | 35 |
| No. ofsamples | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 400 |
| % | 4 | 0 | 8 | 8 | 16 | 0 | 24 | 10 | 8.75 |

F= Friesian B= Buffaloe

The incidence of mycoplasma recovery in lung samples was the same in both species. Isolated strains were identified as M. arginini, M. bovis and M. bovigenitalium. While M. alkalescens could not be isolated from any of the examined lung, muscles and synovia samples.

Concerning mycoplasma from synovial fluid, 17 strains were isolated (Table 2). Among which 12 strains were isolated from Friesian calves.

The isolated organisms in the present study was responsible of many diseases and disorders among cattle. M. arginini could induce pneumonia, orchitis, mastitis and arthritis (Jurmanova and Krejei, 1971). M. alkalescens produces a febrile response and severe fibrinopurulent arthritis when inoculated into joints (Bennett and Jasper, 1978).

M. bovis is one of the most pathogenic species of mycoplasma capable of inducing mastitis, arthritis and pneumonia (Gourlay et al. 1976; Langford, 1977 and Allan et al., 1978). Moreover, it has been isolated from the pneumonic lungs of humans (Madoff et al., 1979).

M. bovigenitalium is an organism of etiologic importance in mastitis (Jasper, 1977). It has also been isolated from pneumonic lungs of calves and from herds with infertility problems (Cottew, 1970).

As regard the PH values, Table (3), the average PH of examined muscle, lung, liver and synovia samples which proved to be free of mycoplasma

were 5.66, 6.73, 6.33 & 7.68 buffaloe calves and 5.66, 6.61, 6.29 & 7.67 for Friesian samples.

**Table (3): The average pH values of examined samples**

| Samples | | Buffaloe | | Friesian | |
|---|---|---|---|---|---|
| | | infected | non infected | infected | non infected |
| Muscle | pH | - | 5.66 | 5.65 | 5.66 |
| | Ns | 0 | 50 | 2 | 45 |
| Lung | pH | 6.78 | 6.73 | 6.76 | 6.61 |
| | Ns | 4 | 46 | 4 | 46 |
| Liver | pH | - | 6.33 | 6.40 | 6.29 |
| | Ns | 0 | 50 | 8 | 42 |
| Synovia | pH | 7.84 | 7.68 | 7.83 | 7.67 |
| | Ns | 5 | 45 | 12 | 38 |

Ns = number of smaples

Sight elevation of PH values in infected samples with mycoplasma was noticed. The recorded PH were 6.78 and 7.84 for lung and synovial buffalo samples and 6.76 and 7.83 for Friesian calves respectively.

The increase in PH value may be due to the increase of certain enzymes. Barthel et al. (1972) showed that mycoplasma infection resulted in increased activity of alkaline phosphatase in synovial fluid due to altration in capillaries permiability that occur during the bactermic phase of the disease resulting in hyperemia and oedema. Similar results were obtained by Stogdale (1981) who found a correlation between the rise in alkaline phosphatase level in tissues due to inflammation of tissues specially in liver diseases and the increase in PH value.

In conclusion, the keeping quality of meat and organs of animals infected with mycoplasma is altered as the alkaline PH provides suitable media for the propagation of pathogenic and spoilage microorganisms. Therefore, when meat of such animals approved for human consumption it is recommended to distribute it quickly and in restricted areas. While severly infected, emaciated or feverish animals necessitate total condemnation.

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