

Brief Communication

**IgG-2 DEFICIENCY IN GANGRENOUS MASTITIS
IN COWS**

In bovine species 4 classes of immunoglobulins have been identified. *Murphy et al.* (1965) have demonstrated the presence of IgM, while *Mach et al.* (1969) and *Vaerman* (1970) have described the presence of IgA in cattle sera. Two subclasses of IgG (IgG-1 and IgG-2) have been described and characterized by *Murphy et al.*, *Pierce & Feinstein* (1965), and *Aalund* (1968). *Nansen* (1970) prefers to designate these subclasses as IgG-fast and IgG-slow. However, it seems to be the general tendency to accept the nomenclature IgG-1 and IgG-2.

It is intended in the present paper to describe the immunoelectrophoregrams with reference to IgG-2 observed in animals affected with gangrenous mastitis along with the findings of investigations into the occurrence of deficiency of this immunoglobulin in healthy animals in some of the farms from which the cases were sent to the clinic.

Animals affected with the disease and admitted to the clinic during the period 1967 to 1971 (June) formed the material of the present study. Details in respect of age, breed, termination of the disease, and immunoelectrophoretic picture are shown in Table 1.

Sera samples were obtained from 156 adult healthy animals from 4 farms from which a case of gangrenous mastitis was admitted in the clinic during 1970—71. The age of these animals ranged from 2½ to 8 years with an average of 5.3 years. All but 2 animals belonged to Red Danish breed, and the remaining 2 animals were Black and White Danish breed (SDM).

Antibovine antibodies were obtained from rabbits immunized according to the method described by *Brummerstedt-Hansen* (1967). The antisera were stored at approx. -20°C till the day of their use. Veronal buffers containing calcium chloride with pH 8.6, but with different ionic concentrations recommended by *Hirchfeld* (1961), were used for vessel and for gel buffers. The

Table 1. Results of immunoelectrophoretic examination and other particulars of the animals.

Sr. no.	Case no.	Breed	Age in years	Termination of the disease	Immunoelectrophoretic picture
1	533/66—67	RDM	2	salvaged	deficiency of IgG-2
2	127/67—68	RDM cross	5	euthanized	do
3	128/67—68	RDM	2	euthanized	do
4	201/67—68	RDM	3	salvaged	normal
5	210/67—68	SDM	7	salvaged	deficiency of IgG-2
6	362/67—68	RDM	4	salvaged	do
7	464/67—68	RDM	8	salvaged	do
8	470/67—68	RDM	2	died	do
9	106/68—69	RDM	2½	salvaged	do
10	264/68—69	RDM	2½	euthanized	do
11	293/68—69	RDM	2	died	do
12	251/68—69	RDM	2½	salvaged	do
13	331/68—69	RDM	3	euthanized	do
14	266/70—71	SDM	4	salvaged	do
15	270/70—71	RDM	3½	salvaged	do
16	282/70—71	RDM	2½	salvaged	do
17	354/70—71	RDM	4	salvaged	do
18	417/70—71	RDM	2½	died	do
19	424/70—71	RDM	4	salvaged	do
20	443/70—71	RDM	3½	salvaged	do
21	521/70—71	SDM	5	salvaged	do
22	103/71—72	RDM	2½	died	normal
23	143/71—72	RDM	2	died	normal

procedure for electrodiffusion was identical with the one reported by *Brummerstedt-Hansen*.

Mansa (1965) carried out immunoelectrophoretic survey of sera from 720 heads of cattle and reported that 7S-gammaglobulin (which is identical with IgG-2 according to *Aalund* (1968)) was absent in 8 animals. *Nansen* (1971) found that 4 out of 180 normal sera (approx. 2%) were deficient in this immunoglobulin. In the present investigations it was found that out of 156 animals screened so far this selective deficiency was shown by 3 animals. It would thus be seen that independent observations carried out show more or less similar findings of the incidence of deficiency of IgG-2 in the adult Red Danish breed animals in Denmark.

In the present investigations on 23 animals suffering from

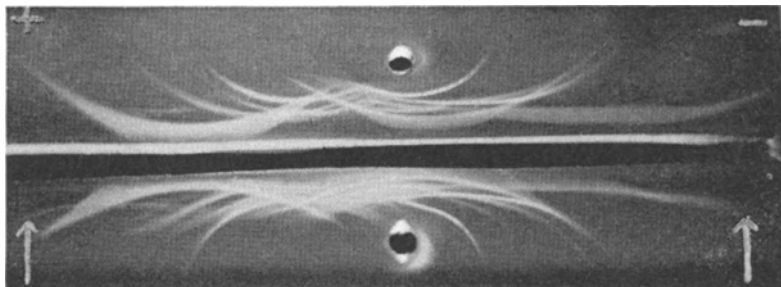


Figure 1. Serum from case no. 354/70—71 (bottom well) compared with that of a normal, healthy, adult Red Danish Milk Breed cow. Rabbit antibovine antiserum is used as antibody. Note the prominent precipitation arc of prealbumin and absence of the arc of immunoglobulin G-2 in the affected cow.

gangrenous mastitis it was found that IgG-2 was deficient in as many as 20 animals (Fig. 1). The remaining 3 animals showed normal immunoelectrophoretic picture as far as IgG-2 was concerned. In all these animals IgG-1 was always demonstrable by immunoelectrophoresis. The other immunoglobulins, viz. IgA and IgM, the precipitation lines of which may sometimes be difficult to recognize, were not evaluated in the present studies.

Analysis of the results of the present investigations points out that a significant number of animals (87 %) which suffered from gangrenous mastitis had deficiency of IgG-2, while the remaining animals (13 %) presented a normal immunoelectrophoretic picture. This is in contrast with the finding that only 1.9 % of the normal adult animals showed this deficiency.

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