

Infectious Bronchitis Variant Strains in the Middle East and North Africa

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Introduction

Infectious bronchitis (IB) virus, first described in the 1930s (Schalk and Hawn, 1931), continues to be a major cause of disease in chickens of all ages and types in all parts of the world (Anon, 1988, 1991). Good quality vaccines have been available to control IB infections since the 1950s. However, despite their careful use, IB continues to be a major problem. One reason for this is the large number of antigenic types of IB that are known to exist worldwide. The first IB serotype to be described was Massachusetts (Schalk and Hawn, 1931). This was followed in the mid-1950s by the Connecticut serotype (Jungheer et al., 1956). Since that time, new IB serotypes continued to be reported from the US (Gelb et al., 1991), Europe (Davelaar et al., 1984; Cook and Huggins, 1996) and many other parts of the world (Cubillos et al., 1991); Middle East and North Africa countries are also suffering from this problem.

With the help of molecular studies, it is now known that it is the S1 part of the IB virus that is responsible for the determination of its serotype. Furthermore, a new IB virus serotype(s) can arise as a result of only a very few changes in the amino acid.

The Middle East and North Africa areas have an estimated poultry population of ~ 4 billion broilers, 160 million commercial layers and 40 million breeders.

In the last few years it was noticed that breeder and layer flocks in the Middle East and North Africa areas were facing different problems such as false layers, penguin position, drop in egg production and no peak in production; while broilers were suffering from respiratory signs, nephritis and high mortality up to 25% with an increase when it is combined with AI-H9N2 or ND.

Although several vaccines were available in the market for controlling IB infection, new variant strains have appeared and cannot be controlled by them. Thus, it has been believed valuable to find out what type of IB variant strains are playing a role in the Middle East and North Africa areas.

Materials and Methods

30575 serum samples, the samples were collected from infected flocks from Middle East and North Africa regions and analyzed using HI and PCR techniques. Serum samples were analyzed for serotyping of IBV variants strains using HI test.

In broiler, HI result considered as positive when it is above 4, while in breeders and layers considered as positive when it is above 6.

For PCR analysis, 324 FTA card samples were analyzed for sequencing.

Results and Conclusion

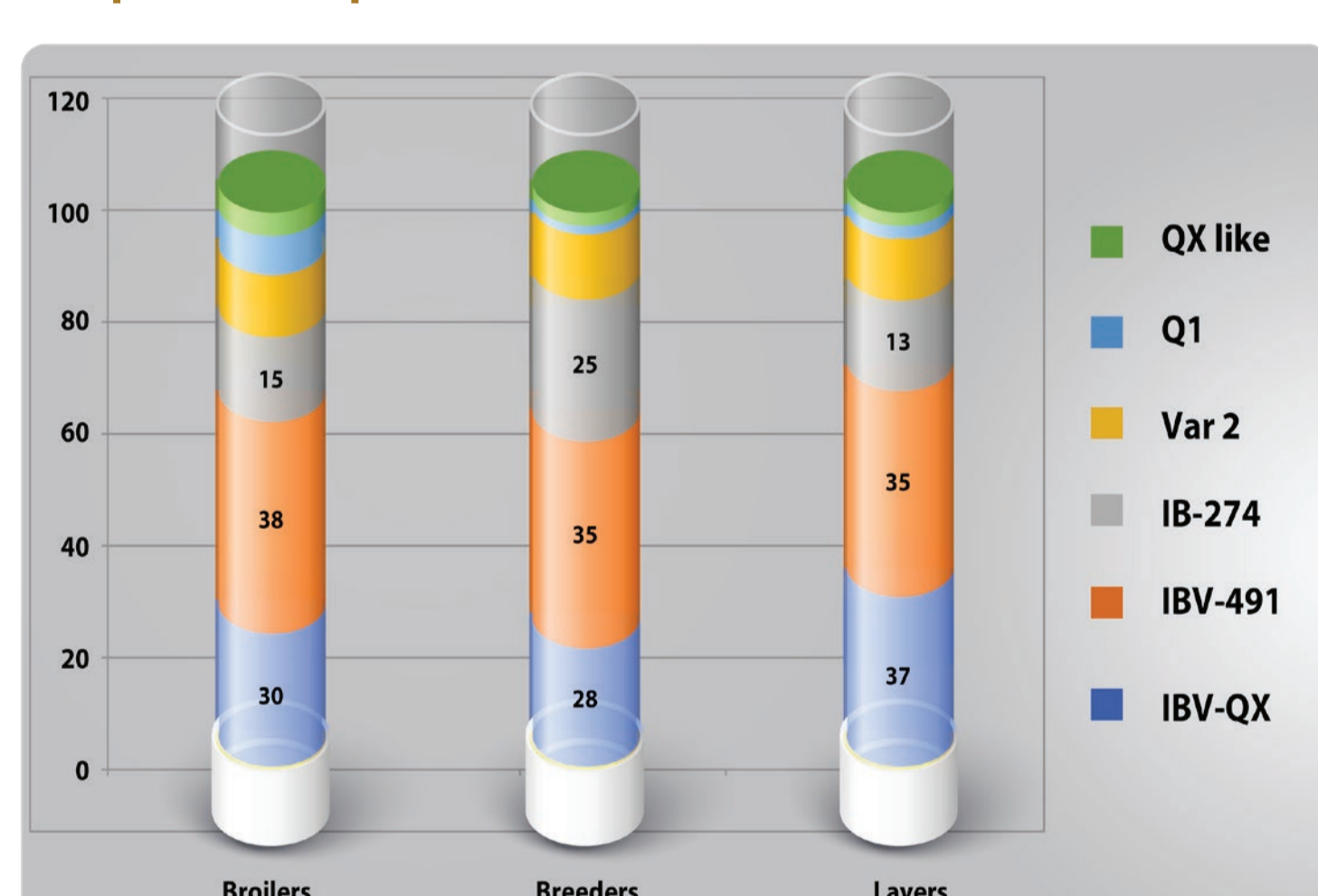
The HI results showed that different IBV variant strains were playing a role in the Middle East/North Africa regions and challenging the flocks such as:

Var 2, QX, 4/91, 274, Q1 and QX like as shown in graph 1

While PCR results showed the presence of more than one IB variant

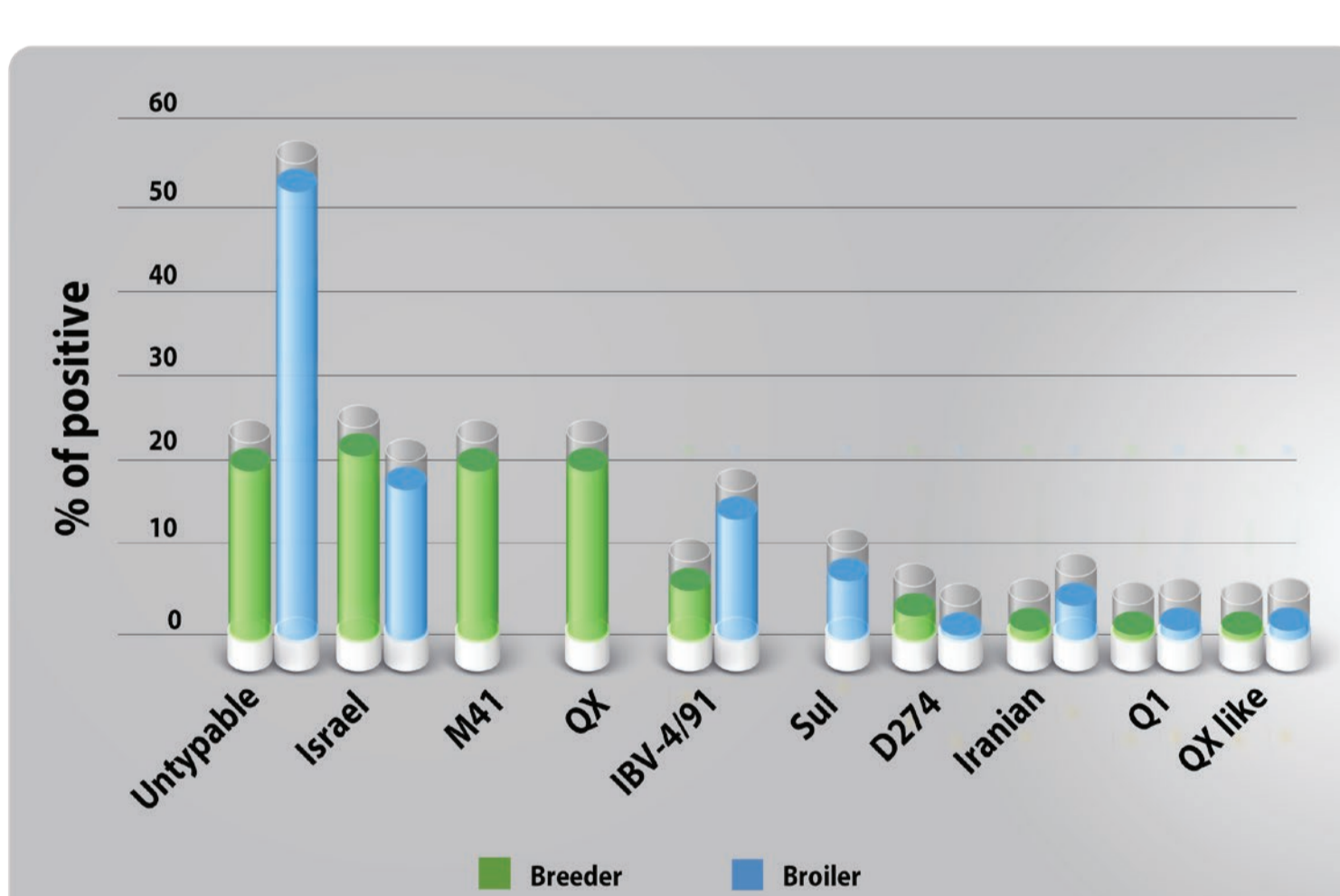
- QX found in Breeder 21 %
- 4/91 found in Breeder 6% and 15% in Broiler.
- 27 4 found in Breeder 3% and in Broiler 1 %
- Iranian found in Breeder 2% and in Broiler 5%
- Sul/01/09 in broiler 8%
- M41 found in Breeder 21 %
- Var 2 found in Breeders 23% and in Broiler 17%
- Q1 and QX like found 1 %

Graph 1: % of positive results* of HI



*: positive results for breeders and layers HI >6 and HI >4 for broilers

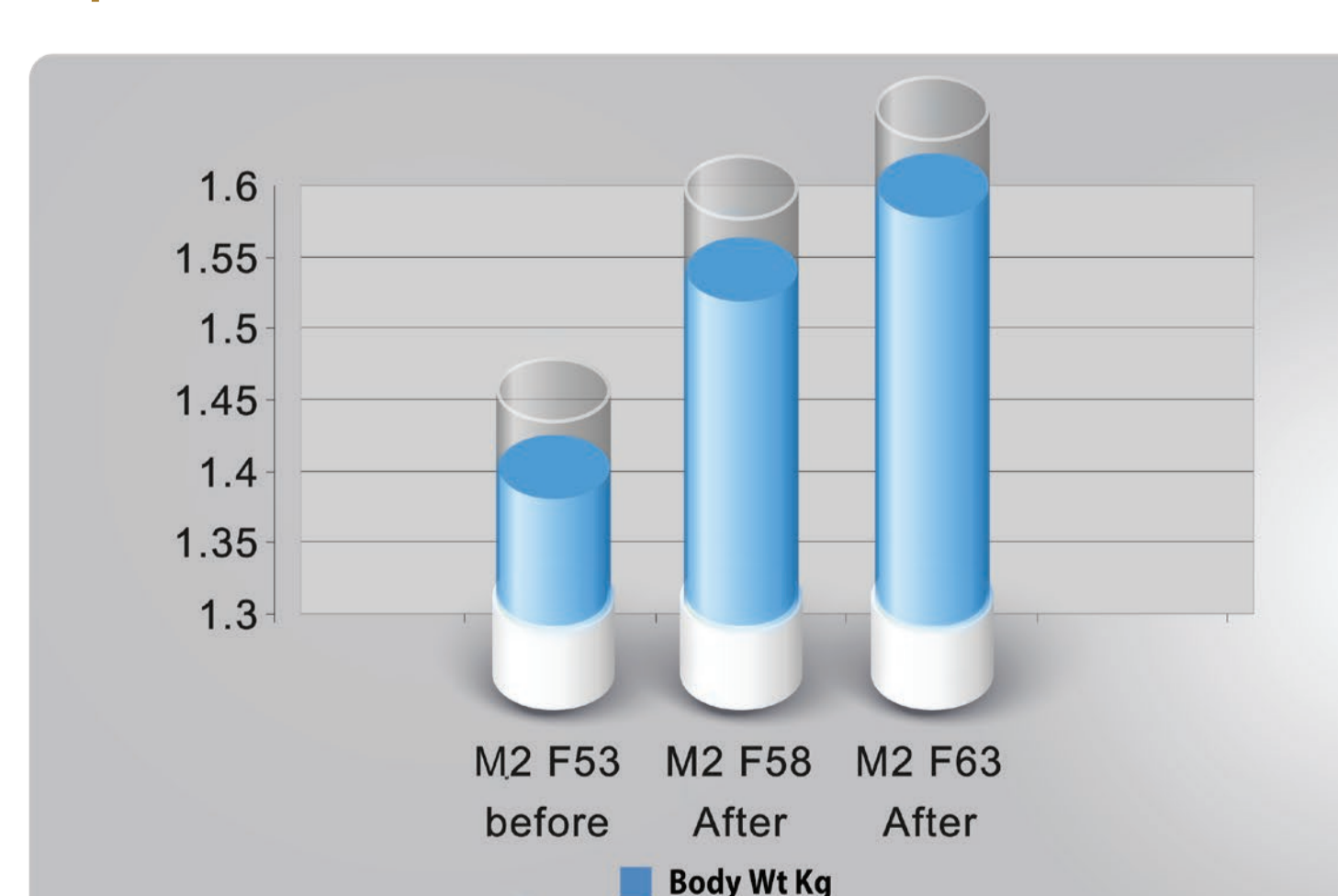
Graph 2: PCR results for IBV variant



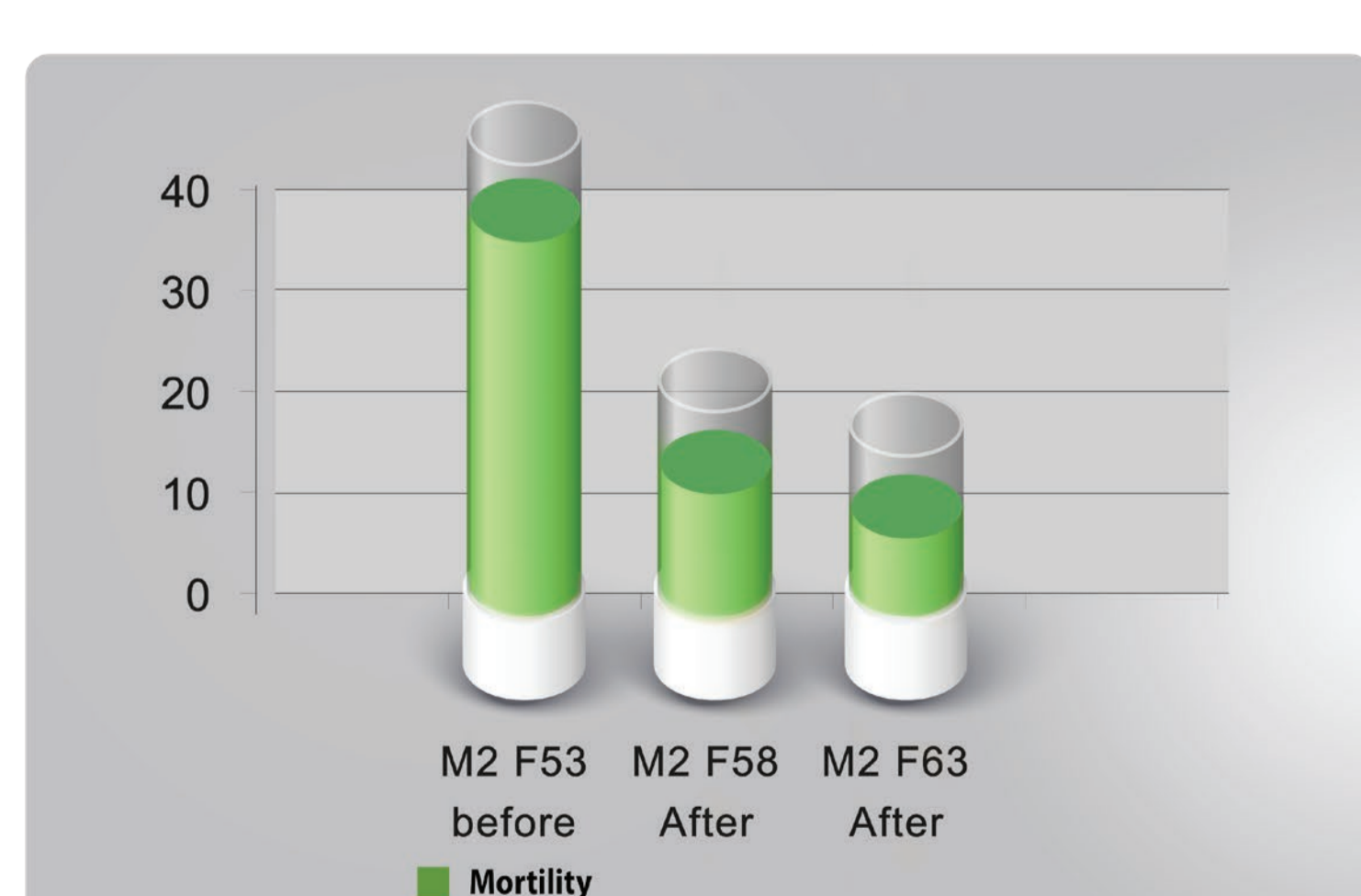
The following parameters were used as parameters:

For broilers: the body weight and mortality, while for breeders and layers, production and egg quality were monitored. After implementation of vaccine (Variant +Mass), reduction in mortality % and increase in body weight were noticed in broilers as shown in graph 3 and graph 4. While in breeders it was noticed there is a drop in egg production during IBV infection, starting from 32 weeks, compared to standard curve as shown in graph 5A. After implementation the vaccine (Variant+Mass) the drop disappeared and production curve returned back to the standard level as seen in graph 5B. However, graph 6 shows the clinical signs in breeders and broilers.

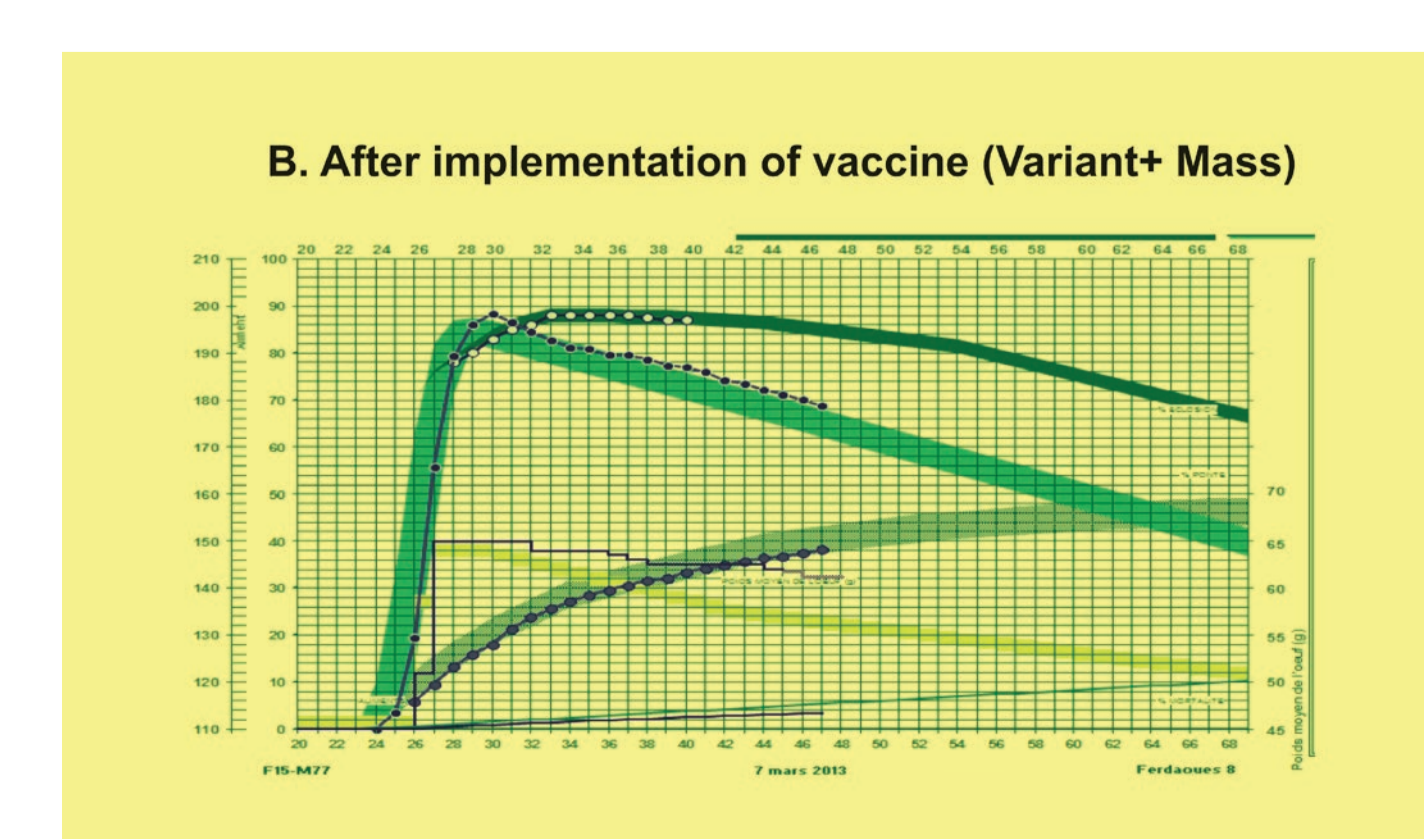
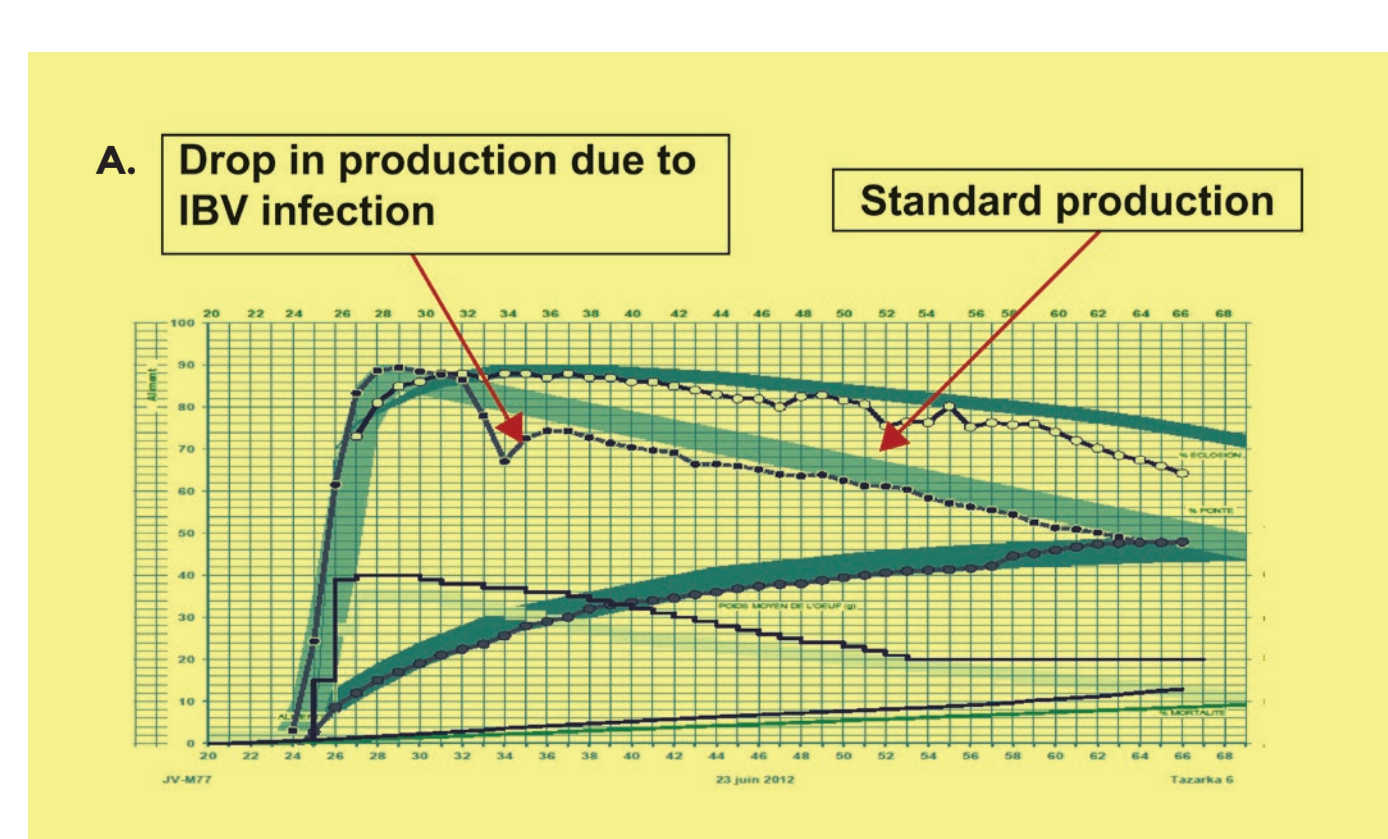
Graph 3: Body weight before and after implementation of IB vaccine (Variant +Mass)




Graph 4: Mortality before and after implementation of IB vaccine



Graph 5: Egg production





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1985: Graduated from University of Baghdad Veterinary College
 1998-1991: Poultry Disease Specialist at the Ministry of Agriculture - Jordan
 1998 - May 2017: Global MSD Animal Health Expert (Middle East, North Africa, Latin America regions) Technical & Pharmacovigilance Director (Middle East & North Africa) and Head of Middle East & North Africa MSD Animal Health Laboratory
 July 2017 - present: Vaxxinova International Technical Manager MENA (Middle East / North Africa) Region

Significant achievements:

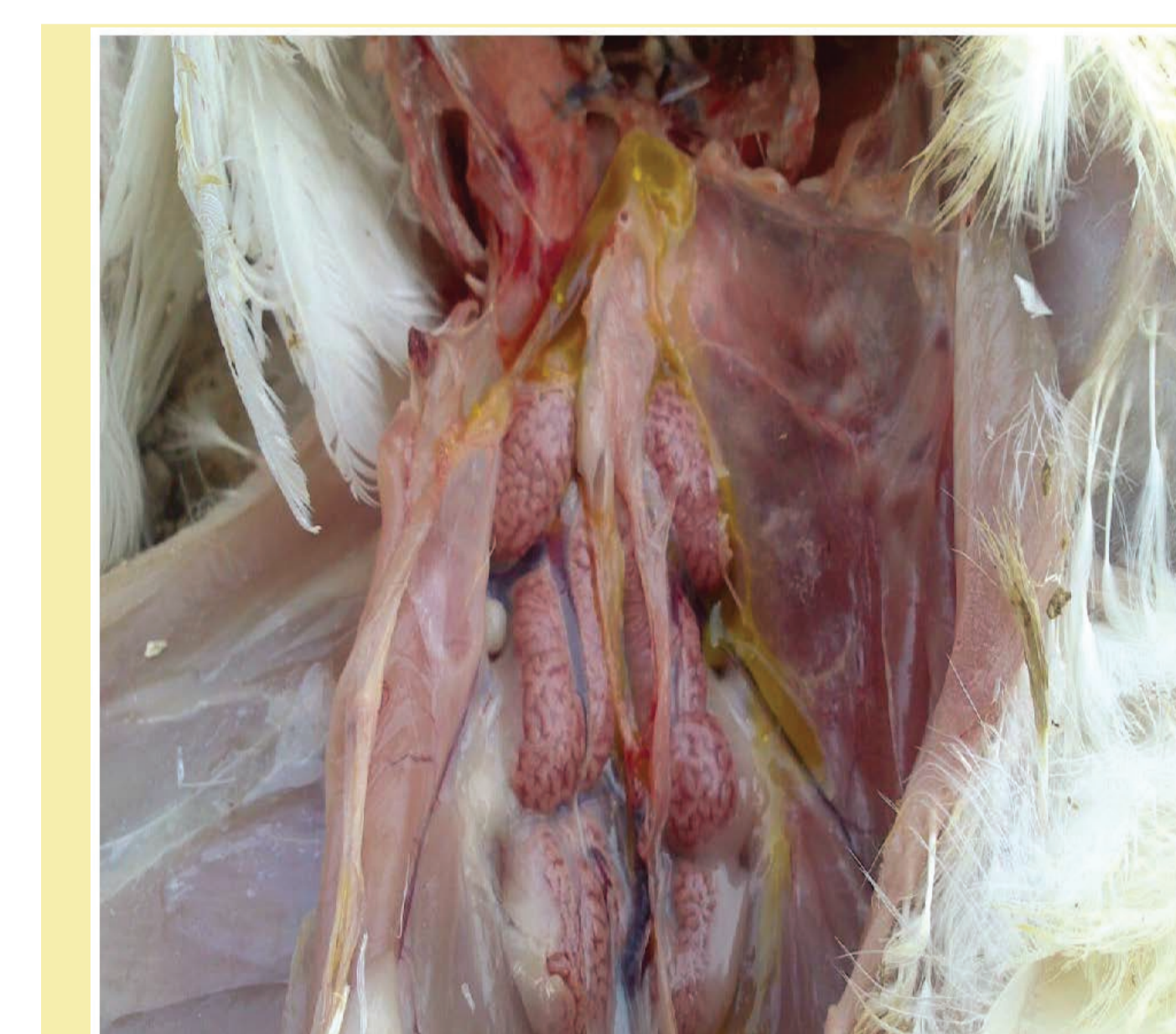
- Gold Medal Award received from the Middle East and North Africa Poultry Magazine (MEAP) for poultry publication & contribution over 25 years.
- Outstanding Achievement Award for the establishment of the Regional Service Lab in the Middle East for MSD Animal Health.
- More than 15 scientific papers accepted by the World Veterinary Poultry Association, American Association of Avian Pathology, World Poultry Science Association, International Production and Processing Expo, Mediterranean World Poultry Science Association and World Poultry Congress on the following diseases: Avian Influenza, Newcastle, IBV-variant strains, Mycoplasma and vaccines failures.
- 5th Arab Conference on Poultry & Feed* Recognition reward for contribution to the improvements in Middle Eastern poultry production.

Graph 6: Clinical signs in breeders and broilers "oviduct fluidity and egg quality"

A) Breeders



B) Broilers



Conclusion

- Presence of only one type of IBV variants at the farm is rare.
- Majority of cases we could find IB combined with other diseases like AI H9 or ND .
- We advised customers to use two types of IB vaccines (variants and Mass) to have broad protection against other IB of having no vaccines in the market.
- Also, we insisted to know which other diseases are existed along with IB in order to be controlled as well.

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