



POLIMUN IB Multi

live attenuated vaccine:
strain BK-07, 793/B
strain H-120, Massachusetts



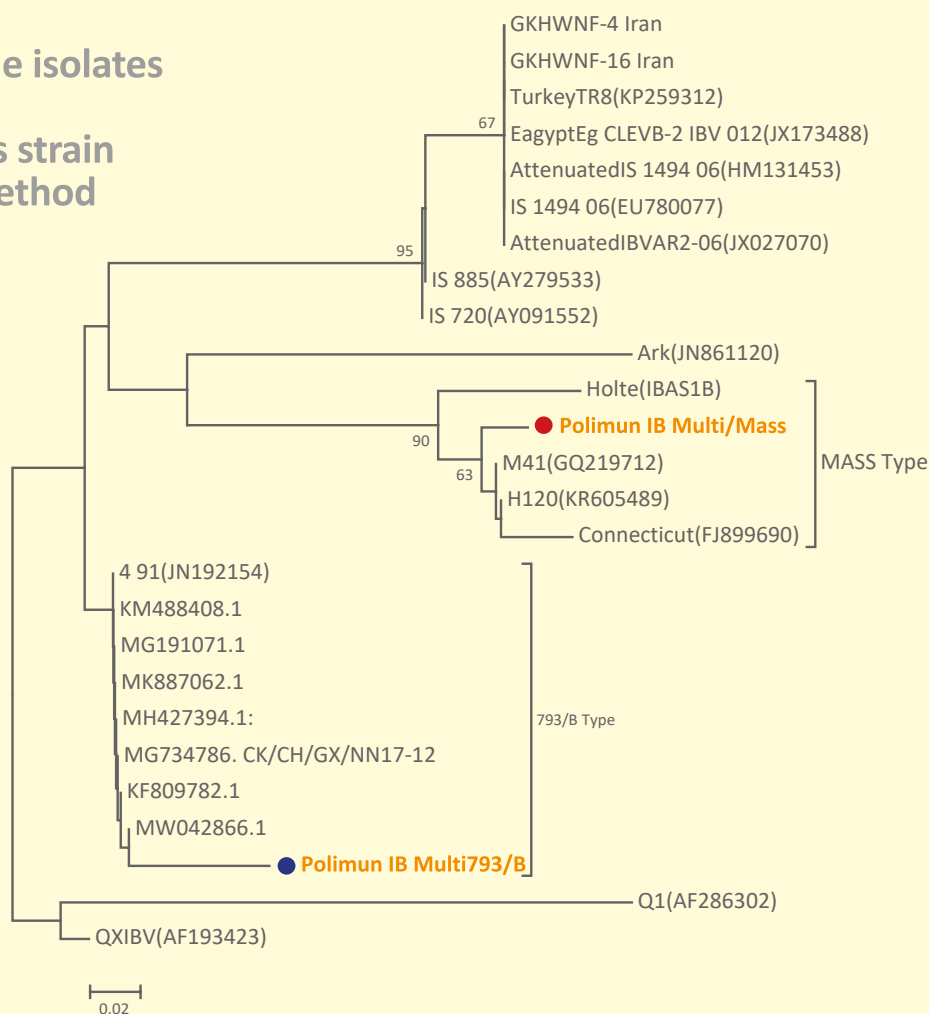
FAST CROSS-PROTECTION AGAINST VARIOUS IBV

Application of two live attenuated vaccine strains from different serotypes of IBV, for example Massachusetts and 793/B types, significantly expands the degree of protection against infection by antigenically different IBV viruses.

Phylogenetic evaluation of POLIMUN IB Multi Avian Infectious Bronchitis vaccine, Veterinary Medicine Faculty of Tegeran University, Iran.

- RNA and DNA extraction (with SinaPure™ ONE Kit)
- PCR carry out with specific primers and submission for sequencing
- Preparation of phylogenic tree and seed approval
- Check for Avian leukosis, mycoplasma and CAV (with diagnostic primers)

Phylogenic tree
based on S1 gene, vaccine isolates
blue circle: 793 / B strain
red circle: Massachusetts strain
MEGA 7 software, ML method



WIDE CROSS-PROTECTION AGAINST VARIOUS IBV STRAINS

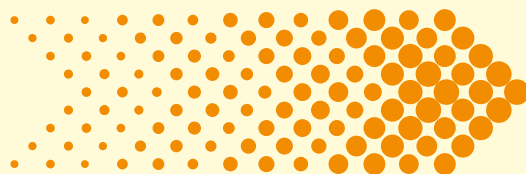
Strains in POLIMUN IB Multi

Cross protection against field strains

H-120 (Mass)

+

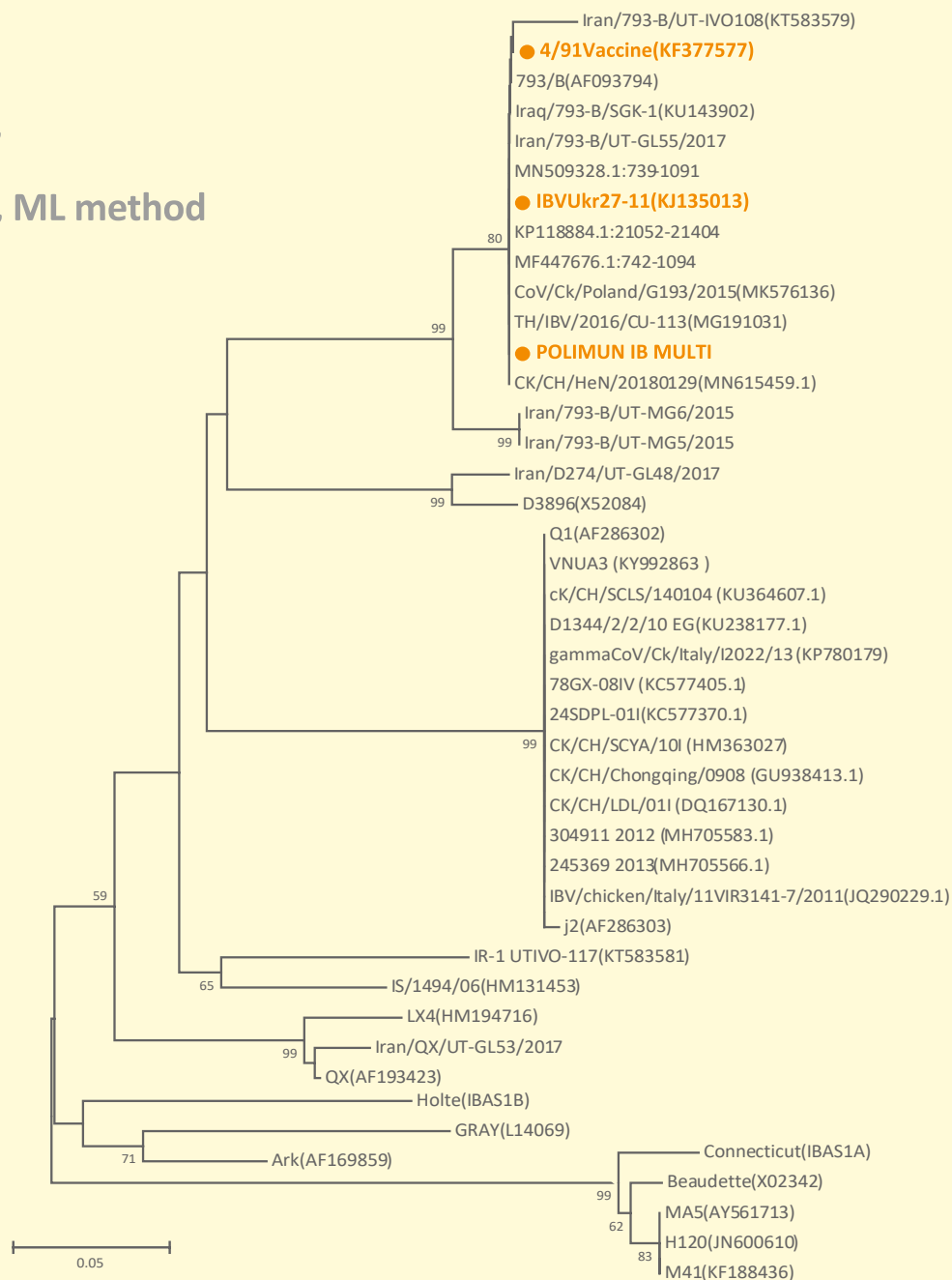
BK-07 (793 B)



Mass, 793B,
Holland, QX China,
Italy-02

The synergistic effect of the combination of vaccine strains in POLIMUN IB Multi allows to provide broad protection of poultry against antigenically different IBVs.

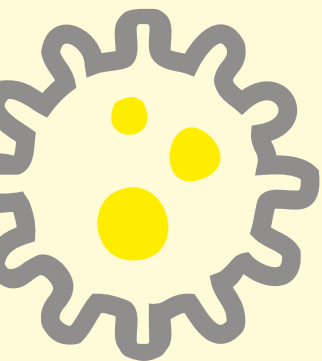
Phylogenetic tree based on S1 gene, vaccine isolates MEGA 7 software, ML method



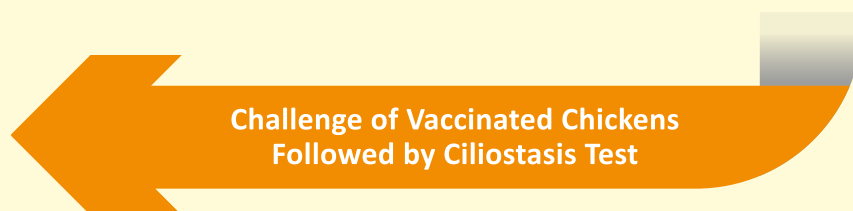
RESULTS OF PHYLOGENETIC EVALUATION

- After specific PCR and sequencing, the Massachusetts strain in the H120 strain vaccine was determined.
- The strain 793 / B contained in the vaccine, was approved.
- The 793 / B strain of this vaccine was more similar to the 4/91 strain among the available vaccines than other vaccines in this group and was similar to the isolated strain from Ukraine.
- Figures show phylogenetic trees (MEGA 7 software) using sequencing based on specific primer (S gene).
- PCR results on external factors such as Avian leukosis, mycoplasma, CAV and microbial culture in this vaccine are negative.

Functional evaluation of POLIMUN IB Multi Avian Infectious Bronchitis vaccine,
Veterinary Medicine Faculty of Tegeran University, Iran



VACCINE ASSESSMENT BY P



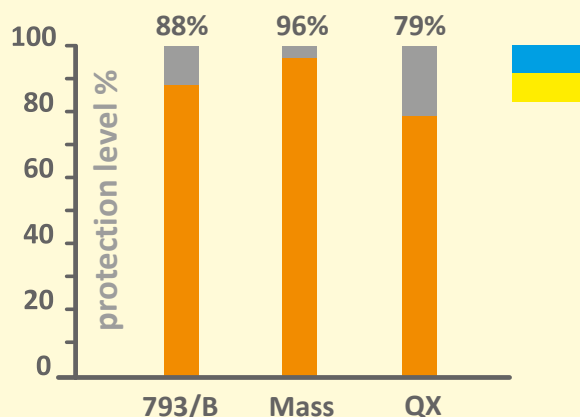
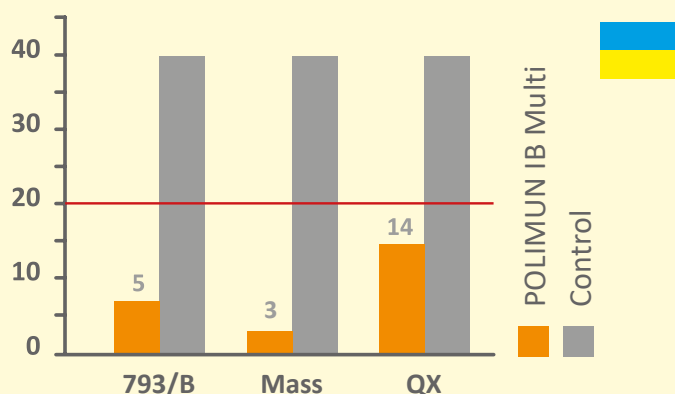
Evaluation of protection after vaccination with POLIMUN IB Multi, ciliostasis test

Tracheal ring scoring system for ciliostasis test

Maintainance of healthy state and mobility of cilia	Score for 1 Trachea	Number of Trachea	General Score
Normal mobility of 100% of cilia; no lesions	0	10	0
Normal mobility of 75% of cilia	1	10	1 - 10
Normal mobility of 50 % of cilia	2	10	2 - 20
Normal mobility of 25% of cilia	3	10	3 - 30
Cilia are absent, the epithelium is completely destroyed	4	10	4 - 40

An overall ciliary activity score of less than 20 indicates protection.

Ciliary protection after challenge 21 days post vaccination



Study of Research Institute of Veterinary Medicine of Ukrainian Academy
of Agrarian Sciences, 2012

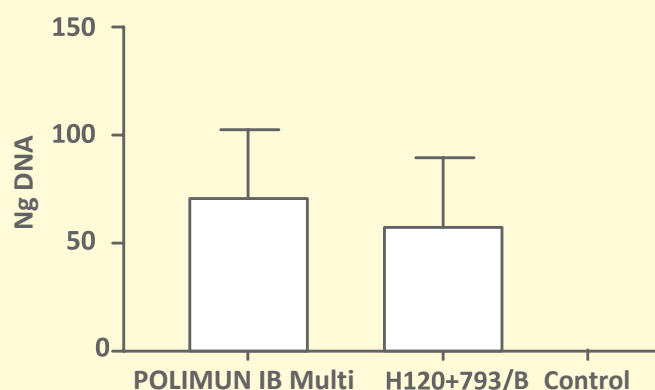
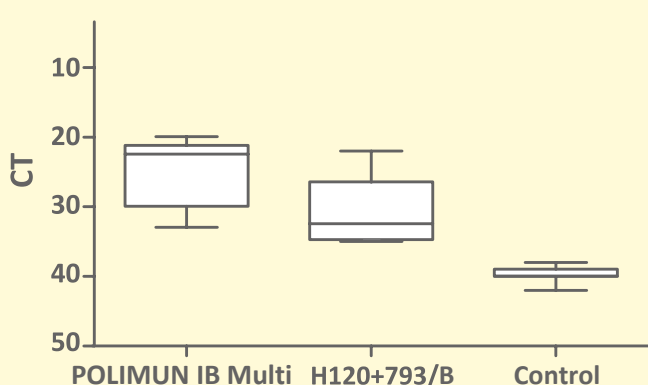
Fast induction of high immunity

Study design: 70 commercial laying hen (LSL) were obtained from barakat poultry company. This Chickens divided into three separate groups (Control, POLIMUN IB Multi, H120+793/B). All groups received standard feeding diets. SPF chickens were vaccinated at day 1 of age with 1 dose of POLIMUN IB Multi per chick, with following infection challenge 3 weeks after vaccination and assessment of ciliar activity of trachea (ciliostasis test) 5 days after challenge.

PERFORMANCE INDICATORS

Speed of Protection
of Vaccinated Chickens

Evaluation of replication of vaccine virus 5 days after administration



The «CT» value is a relative measure of searched genetic material in the sample and is defined in up to 42 cycles. Fewer cycles - higher amount of viral material:
 $ct \leq 25$ – «+++», $ct \leq 26-35$ – «++», $ct \leq 36-42$ – «+», $ct \geq 42$ – «+/-».

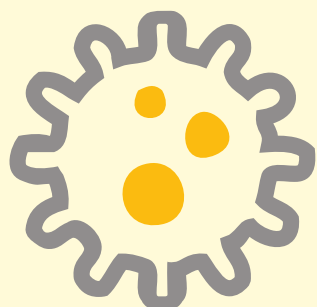
Determination of amount of viral DNA in sample (in nanograms). The higher the indicator - the more DNA of the virus and the more active process of virus replication in target cells.

RESULTS OF FUNCTIONAL EVALUATION

- The replication rate in the Polimun IB Multi vaccine group was higher than the comparison group (H120 + 793 /B) ($P > 0.05$). Vaccines had acceptable replication in both groups.
- POLIMUN IB Multi contains a sufficient, high amount of viral material that promotes active replication of the virus and formation of early defense in poultry.
- POLIMUN IB Multi provides early protection. Active replication of vaccine viruses occurs in trachea of a bird on the 5th day after vaccination.
- The trachea of both vaccine groups showed that the vaccines had similar effects on tracheal ciliary stasis and no difference was seen in their effects. The tracheal cilia have normal beating.

Safety Evaluation of POLIMUN IB Multi Avian Infectious Bronchitis vaccine,
Veterinary Medicine Faculty of Tegeran University, Iran.

SAFETY ASSESSMENT



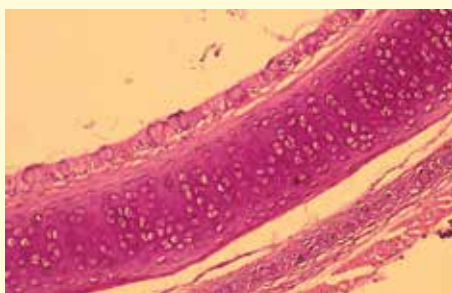
Lesions in tracheae

Safety assessment for absence of post-vaccination reaction in trachea:

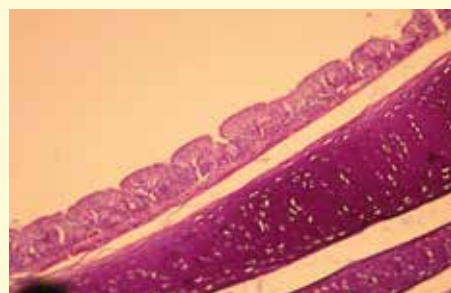
- preservation of integrity of trachea structure
- preservation of the ciliated epithelium
- absence of signs of inflammation
- absence of necrosis of epithelium of mucous membrane

Histological section of the bird's trachea 5 days after vaccination POLIMUN IB Multi.

Preservation of integrity of tracheal ciliated and mucosa epithelium

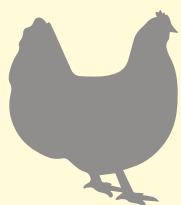


Mucosa epithelium



Ciliated epithelium

BROILERS VACCINATION PROTOCOL



Standard protocol

POLIMUN H-120

POLIMUN IB Multi

0

7-14

Early infection

POLIMUN IB Multi

POLIMUN H-120

days of age

When growing poultry for 50-70 days, additional vaccination of the bird may be required

QUOTES:

«... Using available vaccines in two different serotypes in one vaccination program can provide protection against many types of IB»

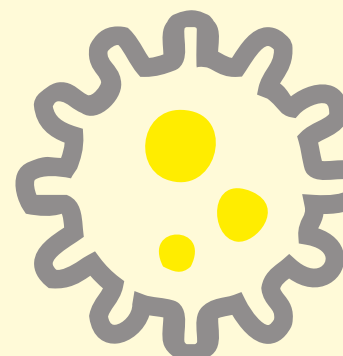
Cook, J.K.A., et al. Breadth of protection of the respiratory tract provided by different live-attenuated infectious bronchitis vaccine against challenge with infectious bronchitis viruses of heterologous serotypes. *Avian Pathology* 1999:28.

Safe to use from day 1 of age

The safety of the vaccine was assessed by vaccination of day-old SPF chickens with a 10-fold dose of POLIMUN IB Multi. The chickens were observed for 14 days after vaccination.

ENT OF VACCINE

Clinical signs



Safety assessment based on the absence of clinical respiratory signs:

- absence of respiratory clinical signs after vaccination
- absence of pathological changes in kidneys

No pathological changes were observed in kidneys of the bird's after vaccination POLIMUN IB Multi.



Control

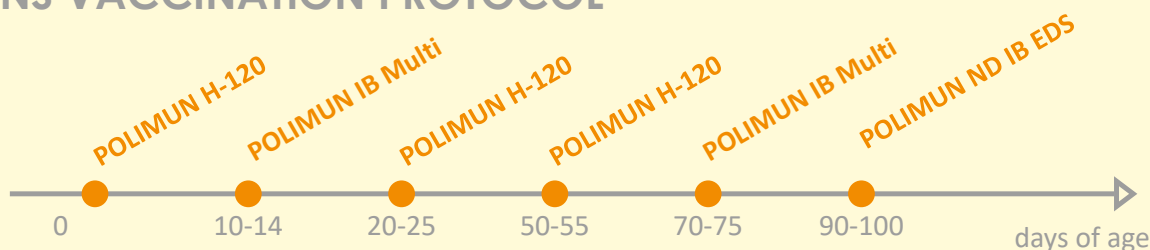
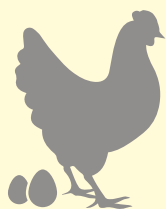


POLIMUN IB Multi



H120+793/B

LAYING HENS VACCINATION PROTOCOL



In event of infection of poultry during productive period, vaccination with POLIMUN IB Multi is possible

QUOTES:

«... because the combination of Mass and 793 / B provides the widest protection, it has the least more likely than other vaccine combinations to breed immunological escapees and more likely to completely neutralize pathogens»

Curry R., Journal of Poultry Respiratory Protection_ISP-PBU-598

GENERAL RECOMMENDATIONS:

Following general rules for poultry vaccinating against IBV can improve situation with IB disease on a farm:

- Homologous vaccine strains provide better protection against corresponding field strains, i.e. vaccine and field strain must belong to the same serotype.
- To provide cross protection against variant strains, it is necessary to use vaccines with different serotypes. For example, for the first vaccination, a vaccine based on Massachusetts strain (POLIMUN IB H-120), and for the second vaccination - based on strain 793/B (POLIMUN IB Multi)
- In conditions of early infection of poultry with IBV, it is advised to use vaccines with antigenetically different serotypes (POLIMUN IB Multi)
- Priming should be carried out using vaccines based on the strain of the Massachusetts type (POLIMUN IB H-120)
- The use of inactivated vaccines for layers and breeders induces stronger humoral immunity. The higher the level of antibodies, the better.
- The best results after the application of the inactivated vaccines are achieved with correct priming schemes for poultry using live vaccines from heterologous strains (POLIMUN IB Multi).
- It is permitted to use live vaccines (POLIMUN IB Multi) during laying period.
- Composition with several heterologous strains in inactivated vaccine causes formation of high level of antibodies to wider number of IBV strains.
- The level of post-vaccination antibodies to IBV virus also depends on strains used in the vaccine, quantity and quality of an adjuvant, content in one dose, quality of application of vaccine.
- Not every variant strain needs its own live and inactive vaccine due to the formation of cross-protection.

Respiratory outbreaks can be caused by violation of vaccine application rules, and not its effectiveness.

VACCINATION CONTROL CHECKLIST

Indicators	Assessment criteria
General issues	
Vaccination method	intraocular / intranasal, spray, drinking water
Dosage	1 dose / bird
Water quality	pH 7,2 – 7,5
Water temperature	12-18°C
Vaccination time	up to 1.5 hours
Spray vaccination	
Drop size	coarse spray from 150 microns (µm) the younger the bird, the larger the drop size
Volume of solution for vaccination	250 - 400 ml / 1000 doses, depending on age
Distance to birds	40 cm
Ventilation, Heating	off
Light	on



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