# 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 antigenicly different IBV viruses.

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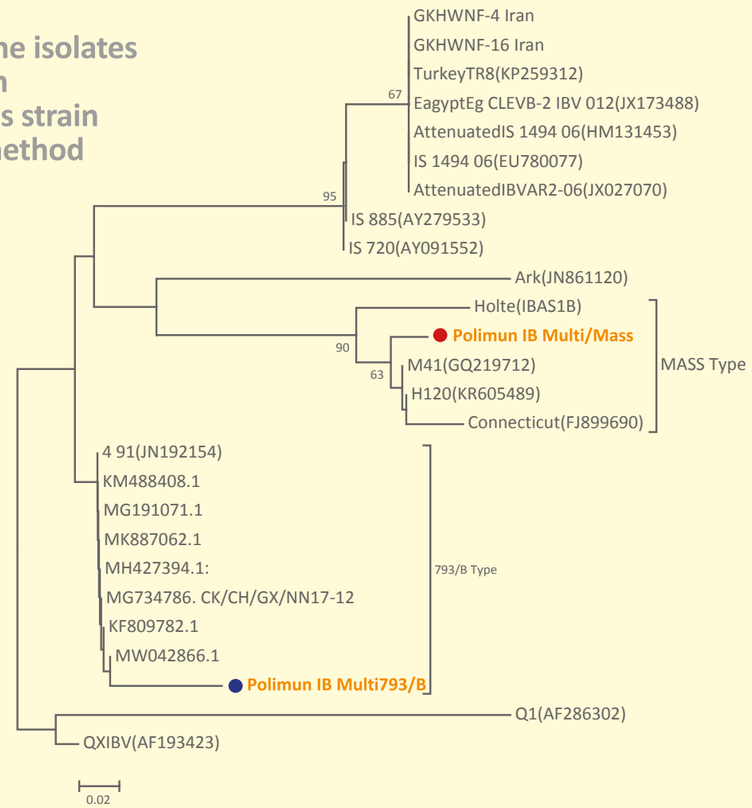
# GENETIC EVALUATION

Wide cross protection

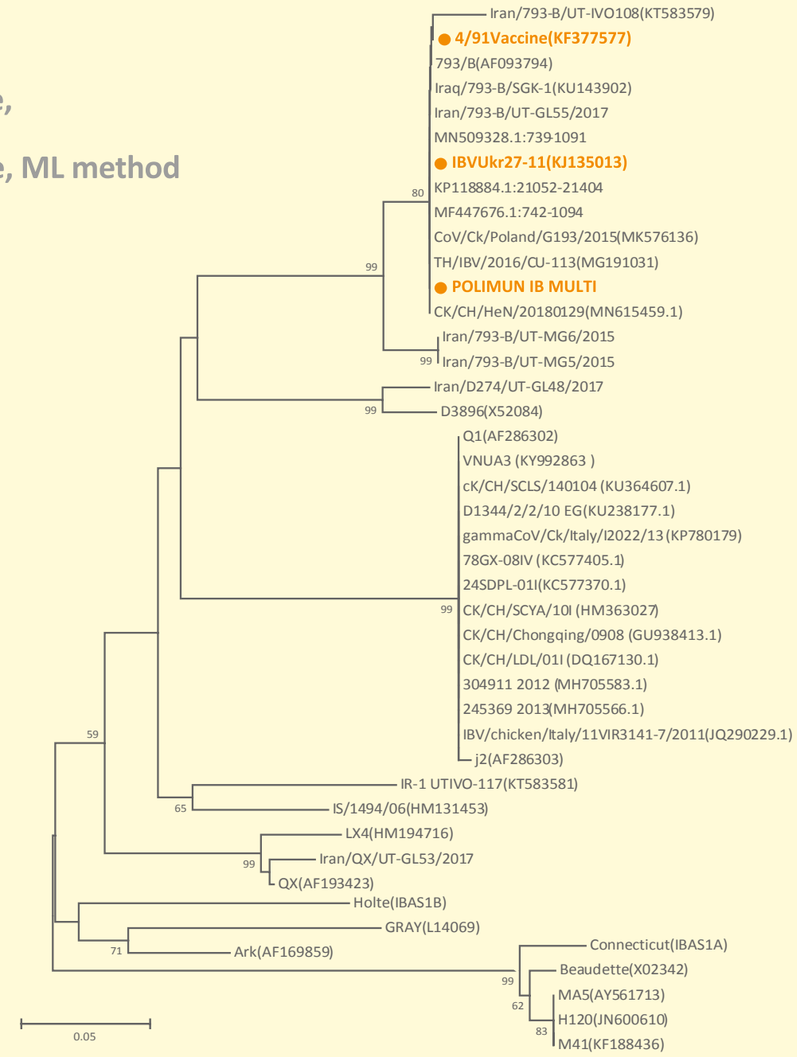
## Phylogenetic evaluation of POLIMUN IB Multi Avian Infectious Bronchitis vaccine, Veterinary Medicine Faculty of Tegeran University, Iran.

- RNA and DNA extraction ( with SinaPureTM 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




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




## WIDE CROSS-PROTECTION AGAINST VARIOUS IBV STRAINS

**Strains in POLIMUN IB Multi**

H-120 (Mass)

+

БК-07 (793 B)

**Cross protection against field strains**

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.

## 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 phylogenic 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.

POLIMUN **EFFICIENCY**

Fast induction of high immunity

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

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.

# VACCINE ASSESSMENT BY PERFORMANCE INDICATORS

**Challenge of Vaccinated Chickens Followed by Ciliostasis Test**

**Speed of Protection of Vaccinated Chickens**

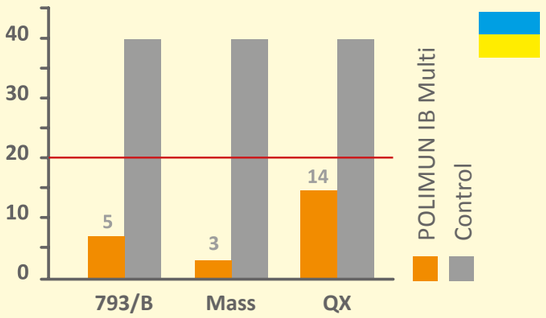
## Evaluation of protection after vaccination with POLIMUN IB Multi, ciliostasis test

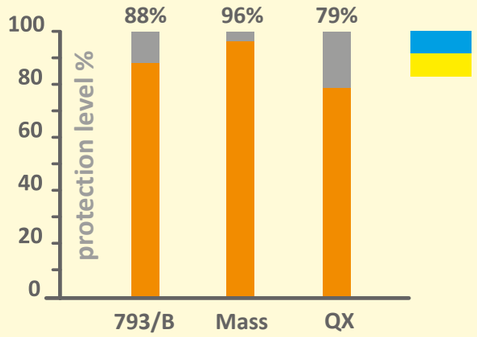
**Tracheal ring scoring system for ciliostasis test**

| 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.

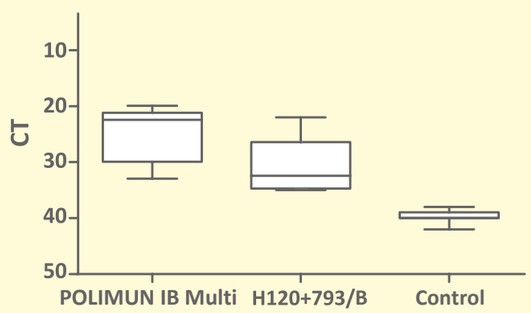
**Ciliary protection after challenge 21 days post vaccination**

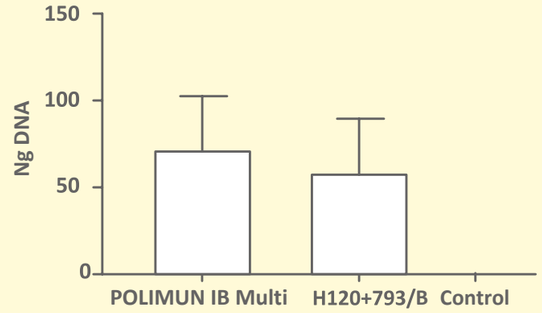



**Study of Research Institute of Veterinary Medicine of Ukrainian Academy of Agrarian Sciences, 2012**

## 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≤25 – «+++», ct≤26-35 – «++», ct≤36-42 – «+», ct≥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 theirs effects. The tracheal cilia have normal beating.

POLIMUN **SAFETY**

Safe to use from day 1 of age

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

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.

# SAFETY ASSESSMENT OF VACCINE

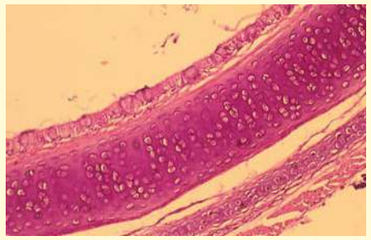
**Lesions in tracheae**

**Clinical signs**

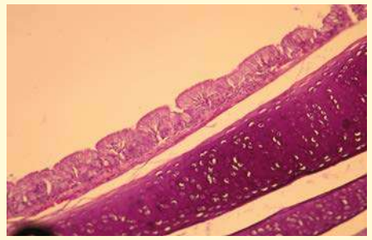
## Safety assessment for absence of post-vaccination reaction in trachea:

- 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

## Safety assessment based on the absence of clinical respiratory signs:

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

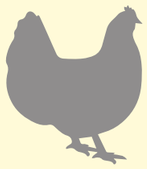
**No pathological changes were observed in kidneys of the bird’s after vaccination POLIMUN IB Multi.**

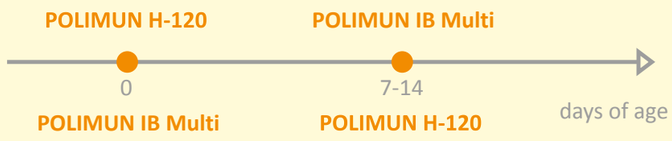
Control

POLIMUN IB Multi

H120+793/B

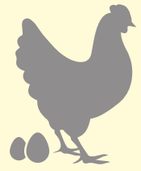
## BROILERS VACCINATION PROTOCOL

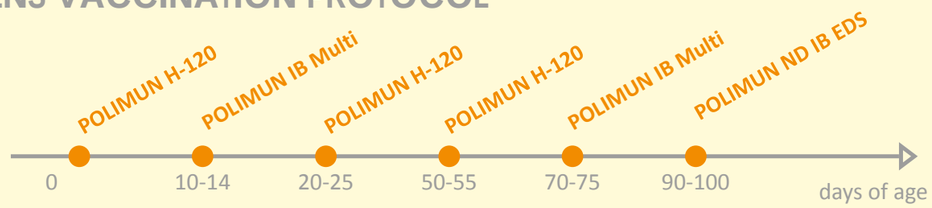





When growing poultry for 50-70 days, additional vaccination of the bird may be required

## LAYING HENS VACCINATION PROTOCOL






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

**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.*

**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 whith 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 permited 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 whider 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 |

# POLIMUN IB Multi

## FAST CROSS-PROTECTION AGAINST VARIOUS IBV

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