Together, beyond animal health

Optimize Protection Through Vaccination Program

Ayatullah Muhammad Natsir

Poultry Business Manager



Outline Discussion

1. Main poultry diseases in Indonesia
2. Poultry vaccines technology
3. Maternal immunity early protection and interference to early vaccination
4. Safety and Efficacy of IBD & ND hatchery vaccinations



Together, beyond animal health

1. Main poultry diseases in Indonesia



Field surveillance in Indonesia





Epidemiological studies on major broiler diseases in Indonesia

I.K. Rambe[1], A.M. Natsir[1], I.T. Nurindra[1]
[1] Ceva Animal Health Indonesia.

Introduction

Epidemiological studies are important to all segments involved in poultry production. Unfortunately, these studies are scarce or even non-existent in Southeast Asia. If available, usually they have limited scope or they are outdated. In Indonesia, the situation is not different and available information on the occurrence poultry diseases is also limited. In order to fill this gap, a group of field veterinarians, coordinated by Ceva Animal Health Indonesia, started to share their cases on a monthly basis and a databank was created.

Materials and Methods

This study, conducted from November 2017 to December 2018 in broiler farms located in Sumatra and Java islands, aimed to investigate the most prevalent poultry diseases in these areas. The data collection was carried out by 31 field veterinarians and the diagnosis was based on clinical symptoms and post-mortem analysis of affected broiler flocks. Laboratory tests for confirmation were carried out whenever possible.

Results

During the assessed period, 390 cases were reported and they were diagnosed as 17 different disorders (Figure 1). The three most prevalent viral diseases were Newcastle Disease (94 cases, 24% of the total), followed by Inclusion Body Hepatitis (73 cases, 19% of the total) and Infectious Bronchitis (33 cases, 8% of the total).
From these cases, Genotype VIIh of Newcastle Disease virus, serotype QX-like of Infectious Bronchitis virus and serotype 8 of Fowl Adenovirus were detected.

Fig 1. Diseases prevalence in broilers in Indonesia from Nov 2017 to Dec 2018

Fig 2. Occurrence of the three most prevalent viral diseases in Indonesia: Nov 2017 to Dec 2018

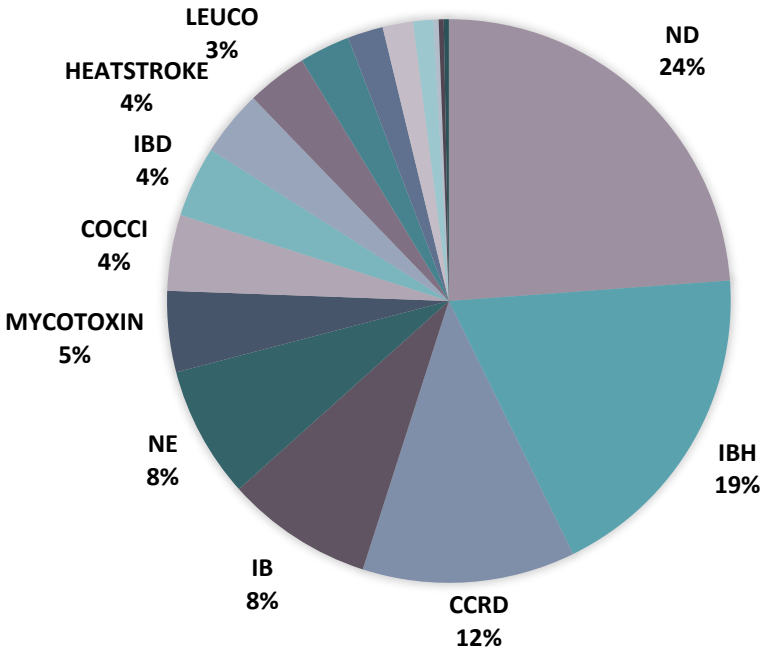
Conclusions

This epidemiological study was mostly based on field presumptive diagnosis and it obviously carries the inaccuracies related to this method of disease investigation. However, relevant information was obtained.
Not surprisingly, Newcastle Disease remains as one of the major challenges to producers in Indonesia and, within the assessed period, the number of cases showed an increasing trend (Figure 2). Interestingly, Inclusion Body Hepatitis and Infectious Bronchitis appeared among the most prevalent diseases and also displayed a growing tendency. Finally, even field conditions diagnosed as CCRD might have the participation of NDV or IBV.

Source: Rambe *et al*. Epidemiological studies on major broiler diseases in Indonesia. Proceedings of the 21st World Veterinary Poultry Association Congress (WVPA2019). Bangkok, Thailand, p. 435, September 2019

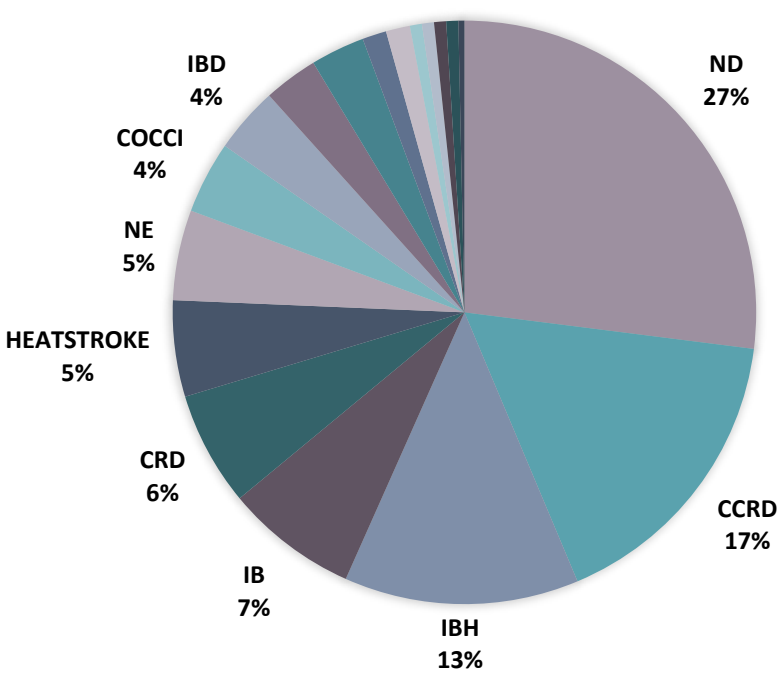
Epidemiological survey in Indonesia

Broiler commercial



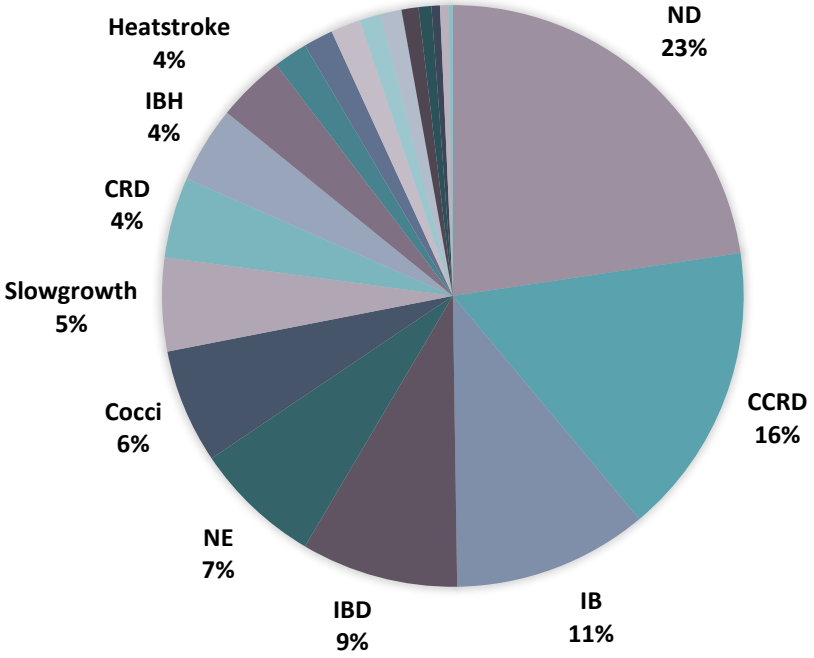
2018

n: 344 reported cases



2019

n: 300 reported cases



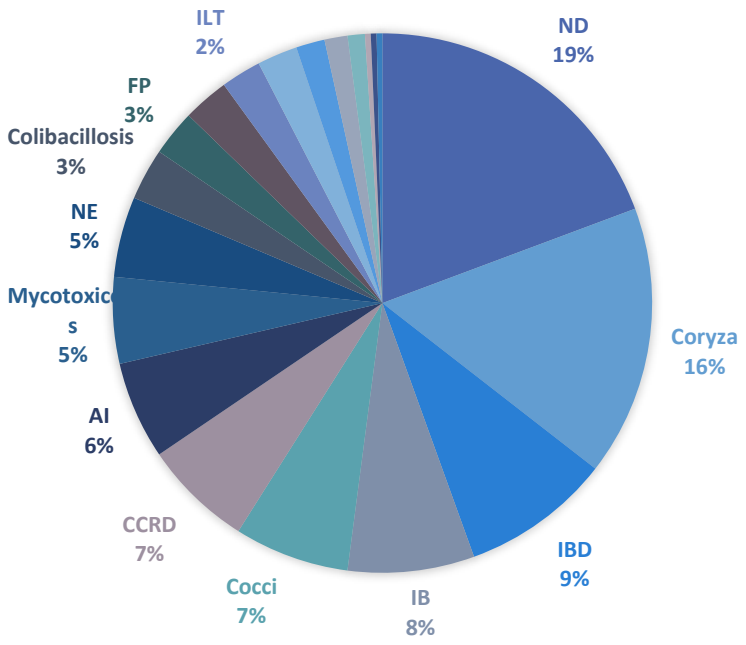
2020

n: 424 reported cases

- The data collection was carried out by **±30 field veterinarians** and the diagnosis was based on clinical symptoms and post-mortem analysis of affected flocks. Laboratory tests for confirmation were carried out whenever possible.

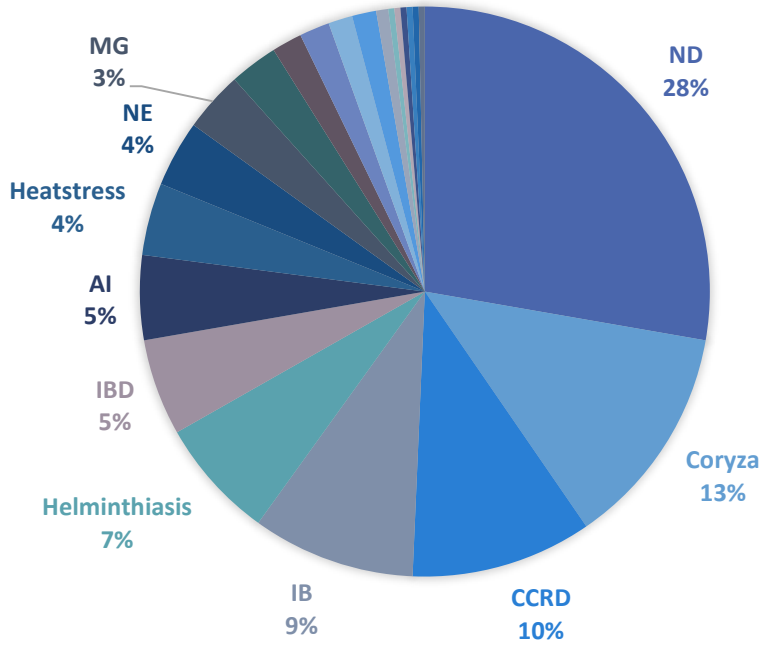
Epidemiological survey in Indonesia

Layer commercial



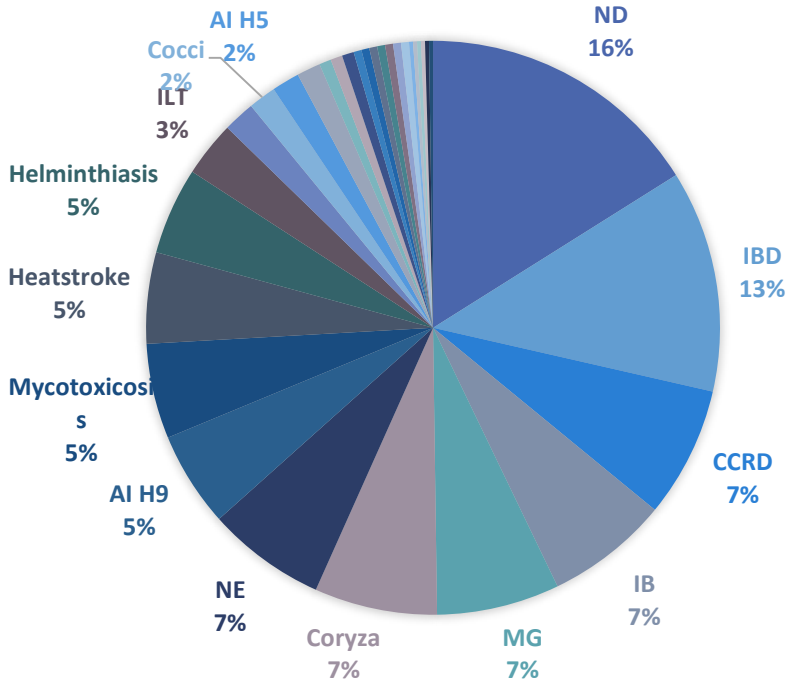
2018

n: 290 reported cases



2019

n: 292 reported cases



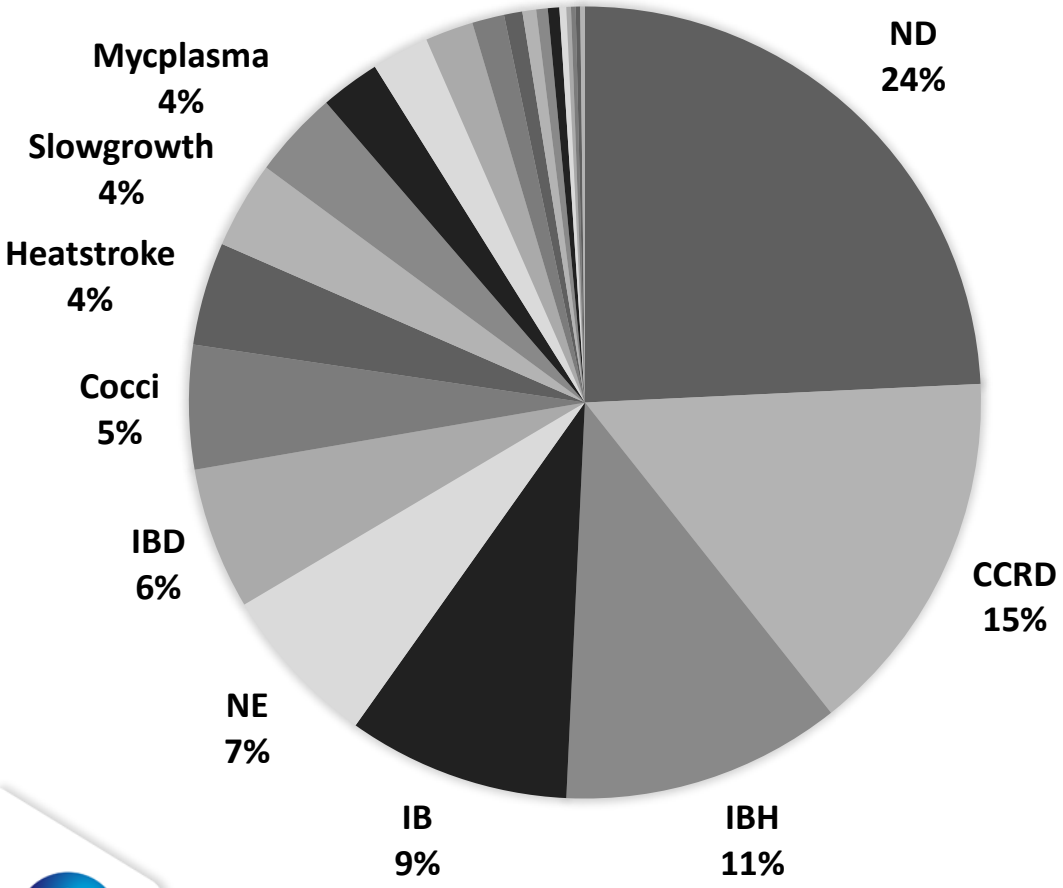
2020

n: 448 reported cases

- The data collection was carried out by **±30 field veterinarians** and the diagnosis was based on clinical symptoms and post-mortem analysis of affected flocks. Laboratory tests for confirmation were carried out whenever possible.

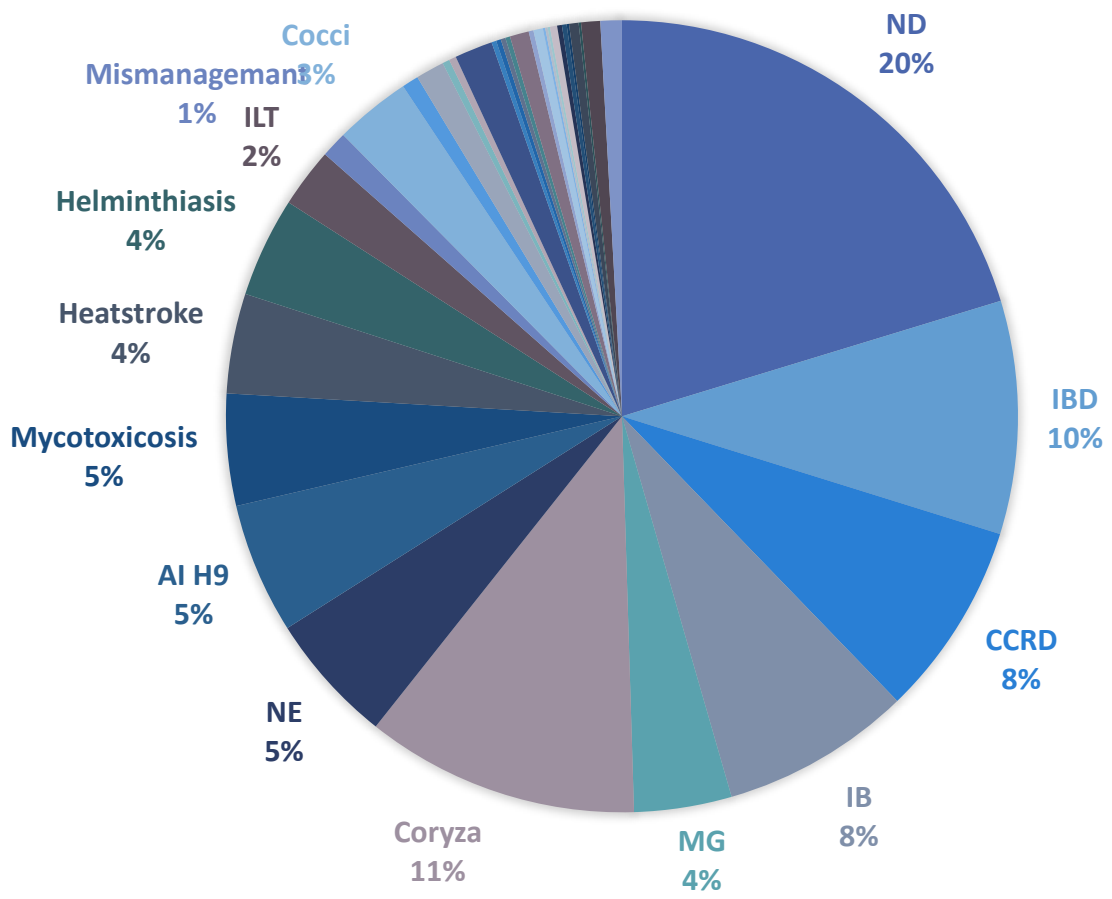
Epidemiological survey between 2018 -2020

Broiler Commercial



n: 1068 reported cases

Layer Commercial



n: 1030 reported cases

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2. Poultry vaccine technology



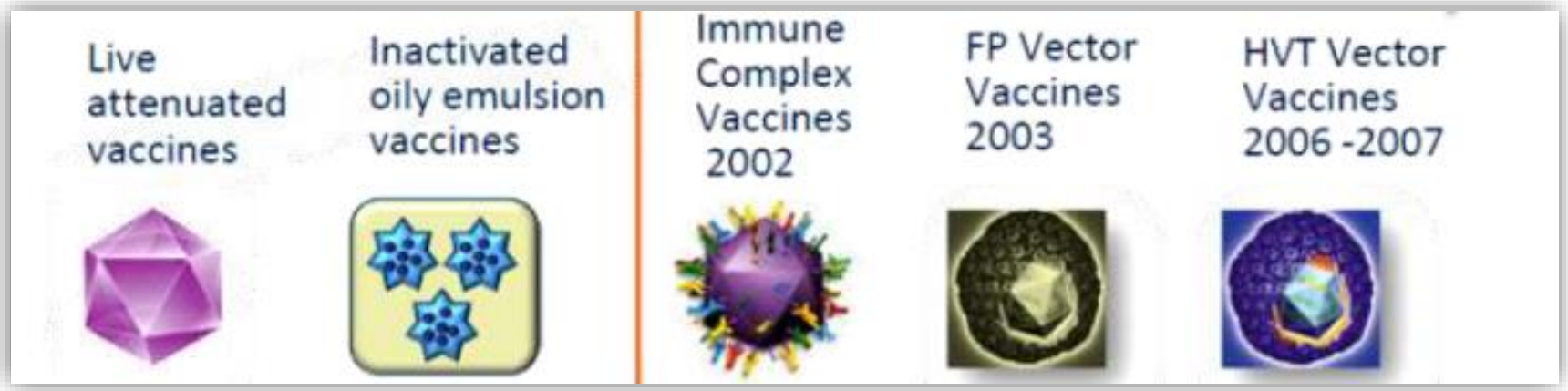
Poultry vaccine technology

Conventional vaccines

1. Live vaccines
2. Inactivated vaccines

New technology vaccines

1. Immune complex vaccines
2. Genetic Engineered vaccines
   a) Recombinant vaccines: Fowl pox based vector and HVT (herpes virus turkey) based vector
   b) Reverse genetic
   c) Subunit
   d) Etc



Poultry vaccine technology

Key aspects of vaccines and vaccination

- Safety
- Efficacy
  - Onset and duration immunity
  - Broad and complete protection
- Easy to handle and application
- Compatibility with others vaccines

Hatchery vaccination in poultry industry

ND

IB

AI(H5/H9)

ILT

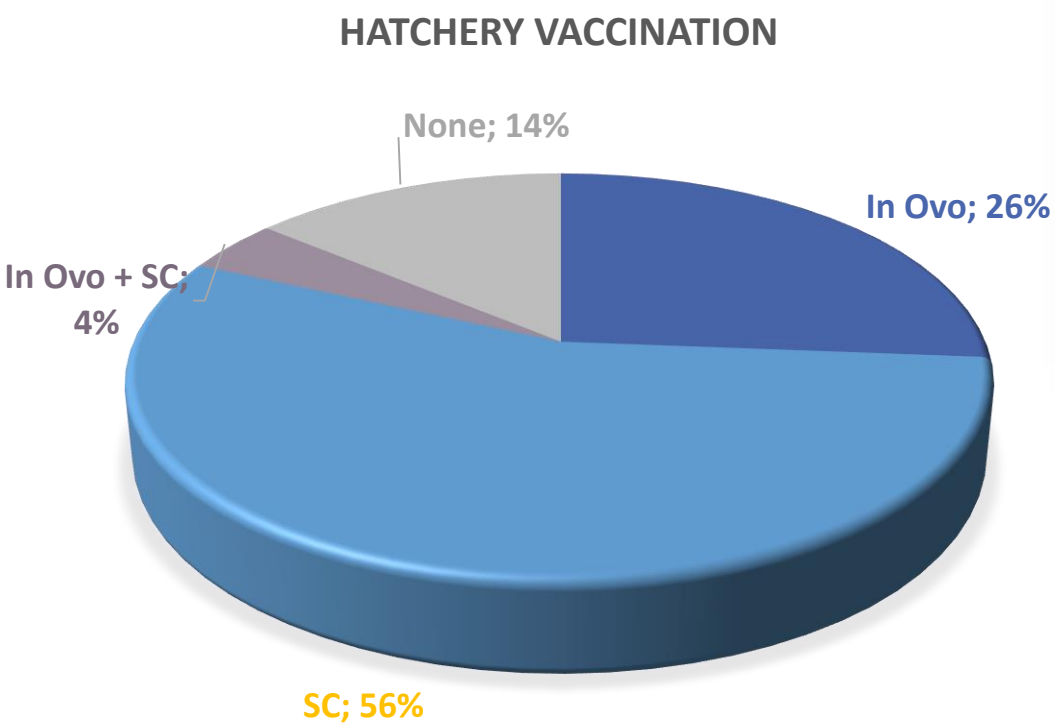
Mareks

IBD

COCCI







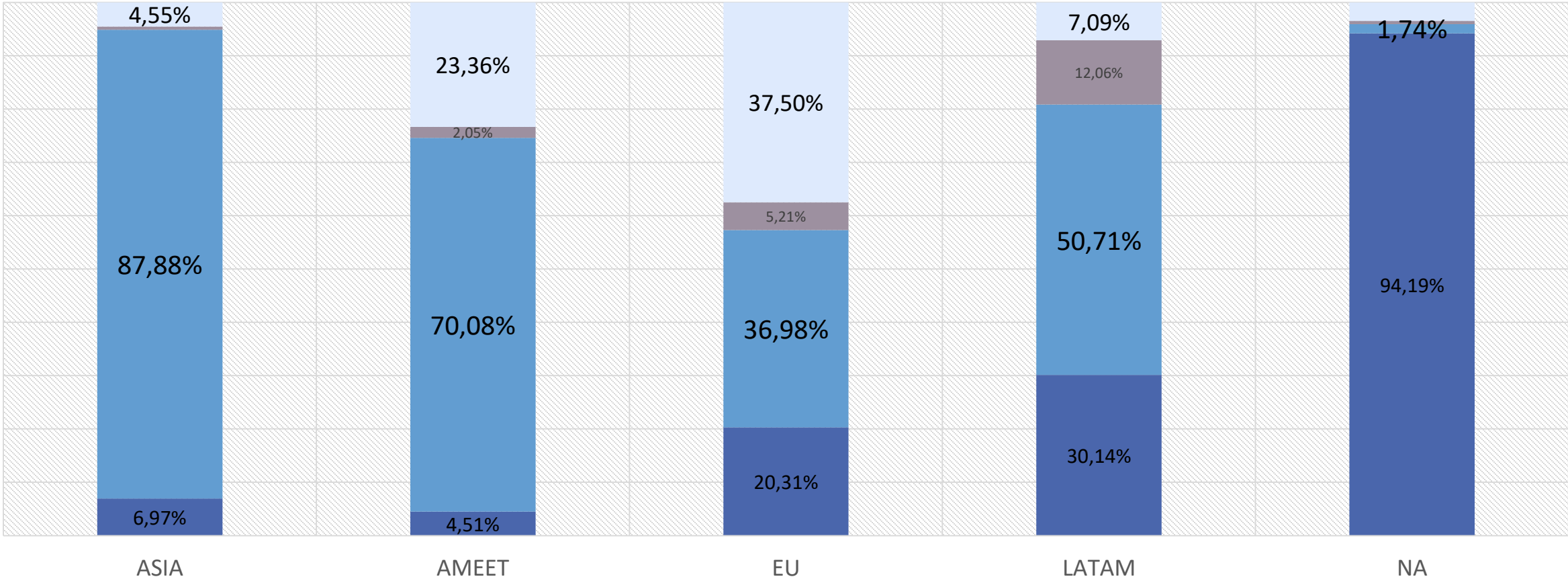


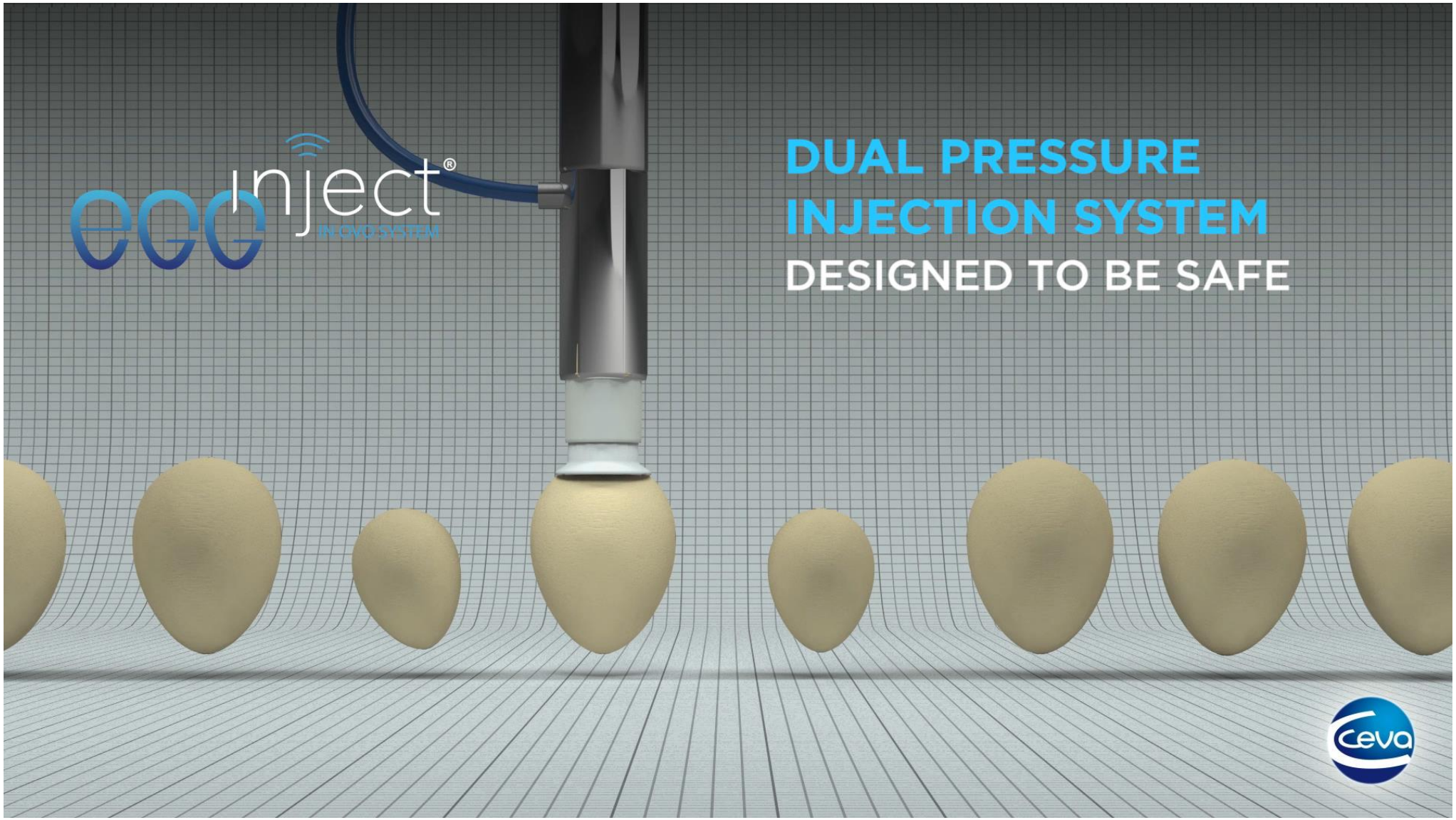


710 Companies , 1310 Hatcheries and 34 Key countries

USA, Canada, EU, Brazil, Mexico, Argentina, Colombia, China, Indonesia, India, Philippine, Thailand, Malaysia, Pakistan, Russia, Turkey, South Africa, Egypt, Iran, Jordan

HATCHERY VACCINATION BY ZONE



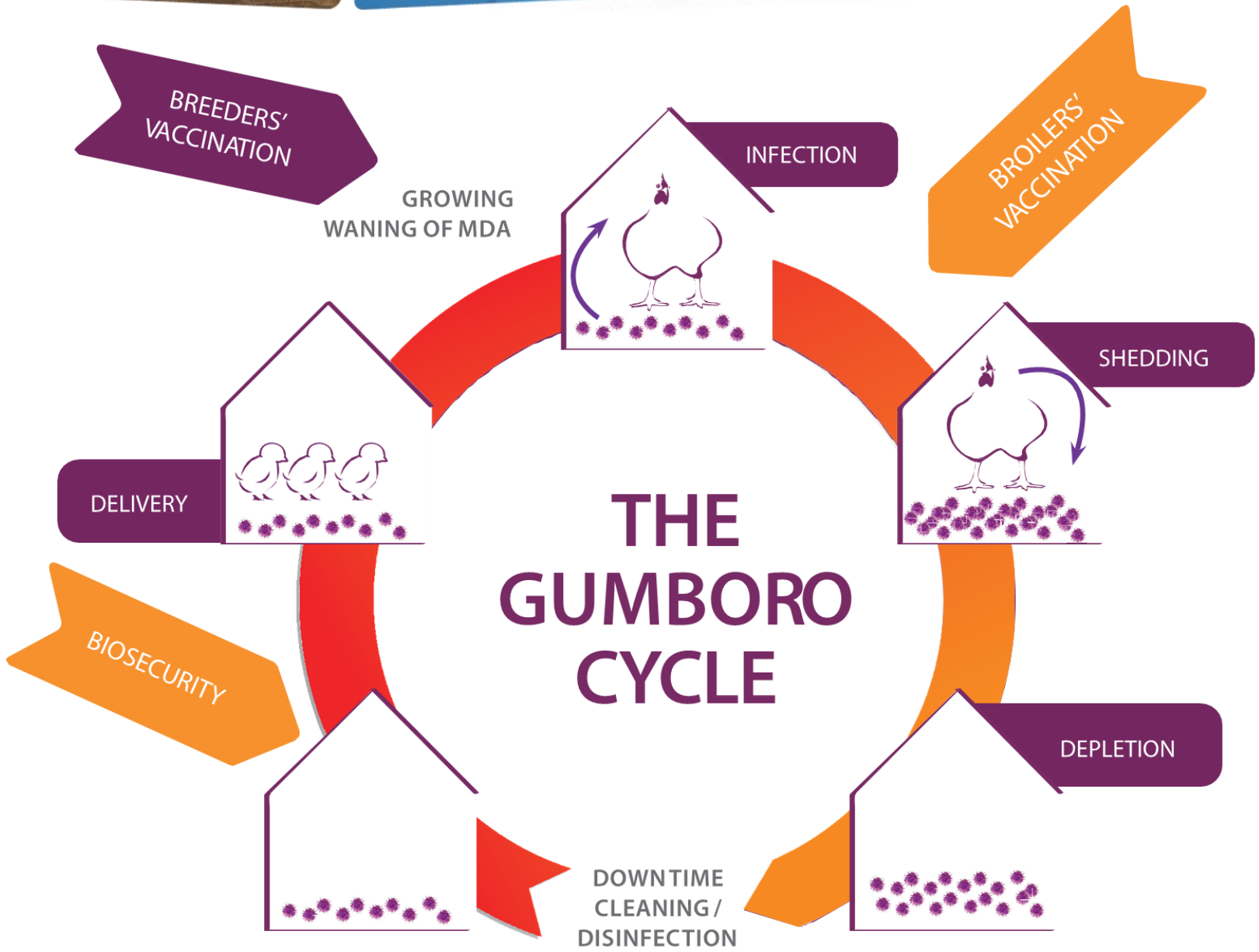

ecg inject®
IN OVO SYSTEM
DUAL PRESSURE
INJECTION SYSTEM
DESIGNED TO BE SAFE
ceva

Together, beyond animal health

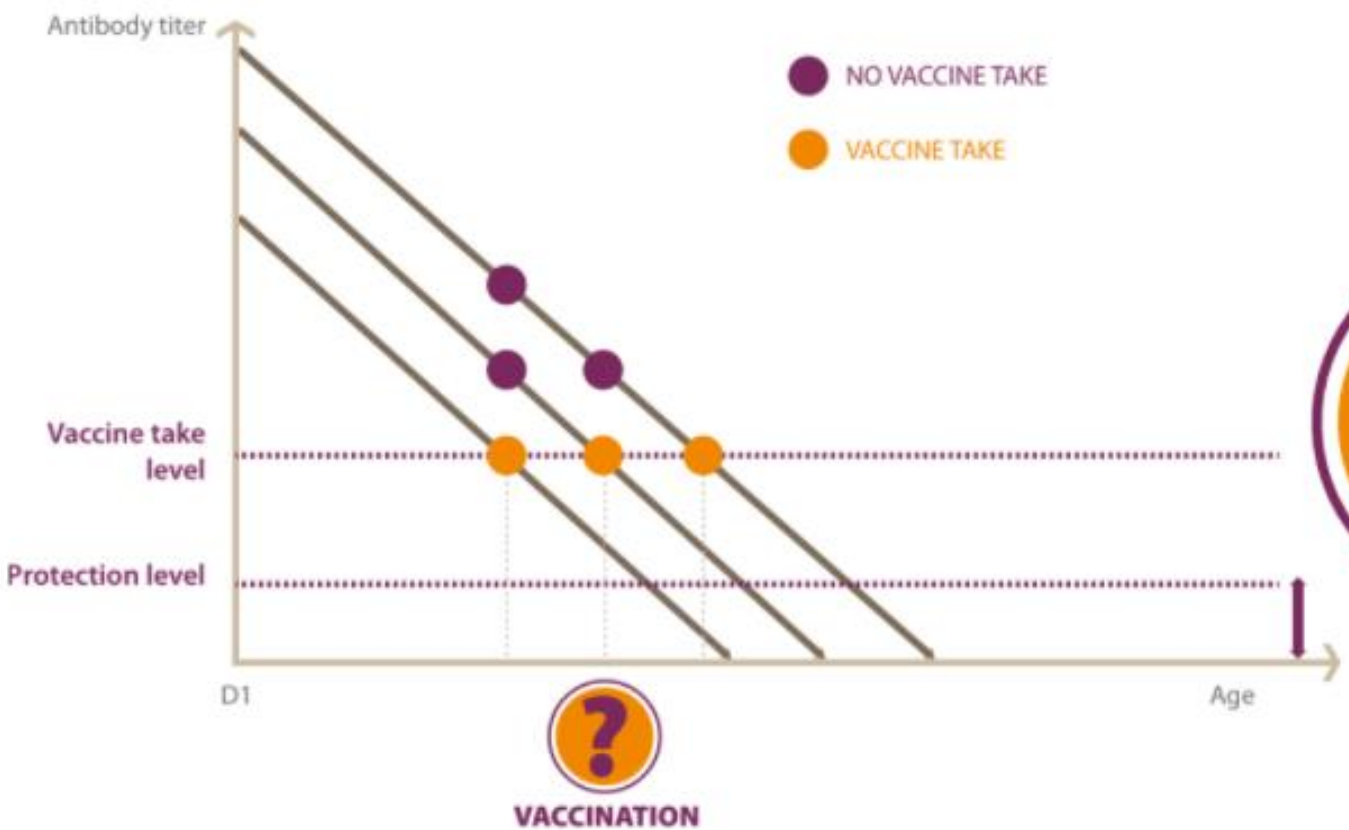
3. Maternal immunity interference with early vaccination



MDA interference / Gumboro disease


BREEDERS' VACCINATION
GROWING WANING OF MDA
INFECTION
BROILERS' VACCINATION
SHEDDING
DELIVERY
THE GUMBORO CYCLE
BIOSECURITY
DEPLETION
DOWNTIME CLEANING / DISINFECTION

VACCINATION IN THE FARM



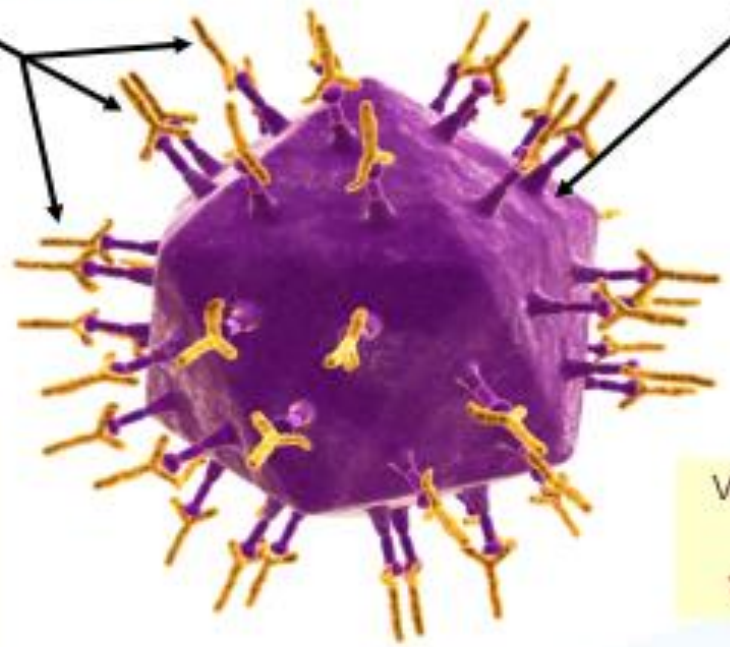


Gumboro disease vaccination: the solution

Specific Antibodies
(Virus Protecting Immunoglobulins, VPI)

+

Vaccine Virus Strain
(Winterfield 2512)



- VPI protect the vaccine virus from maternal antibodies
- VPI avoid the early contact between the embryo and the live virus.
- VPI delay the virus release by 7 - 10 days

VPI allow the adaptation of the Im-Cx to any MDA level at hatch

Vaccination on individual bases!

Safety of IBD hatchery vaccines

The importance of bursa fabricius

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Vol. 111, No. 2, August 1973
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Printed in U.S.A.

EFFECTS OF BURSECTOMY AND THYMECTOMY ON ONTOGENY OF FOWL IgA, IgG, AND IgM[1]

DANIEL Y. E. PEREY AND JOHN BIENENSTOCK[2]

From the Departments of Pathology and Medicine, Division of Immunology, McMaster University Medical Center, Hamilton, Ontario, Canada

Accepted for publication February 20, 1973

Different Effects of Bursectomy of Chickens on Immune Response to Newcastle Disease Virus and *Salmonella pullorum* Antigens

HARUO MATSUDA AND YUKIO BITO

Department of Animal Microbiology, College of Agriculture, University of Osaka Prefecture, Mozuumenachi, Sakai, Osaka, Japan

(Received for publication September 11, 1972)

ABSTRACT The critical age at which chickens become bursectomy-resistant in the development of the immune system against Newcastle disease virus (NDV) and *Salmonella pullorum* (SP) antigens was one and 16 days, respectively. Chickens bursectomized at 14 days of age and administered simultaneously with the two microbial antigens at 6 weeks of age responded only to NDV antigen by producing hemagglutination inhibition (HI) antibody. Such a selective immune response to NDV antigen in chickens bursectomized at 14 days of age was ascertained also by the detection of antibody-forming cells in response to the simultaneous injection with both antigens.

POULTRY SCIENCE 52: 1042–1052, 1973

The importance of bursa fabricius

Assessment of humoral immune response to live Newcastle disease (ND) vaccination in surgically bursectomized broiler chickens

The aim of this study was to mimic the effect of bursal function loss on the humoral immune-response bursectomy (BX) and to see if this could be used as model. The influence of age on the outcome of losing bursal function was investigated by performing bursectomy at different ages and then monitoring the humoral immune response to ND vaccination.

Why is the bursa necessary:

- Main role is to regulate B-cell development
- The microenvironment in the bursa allows regulated activation of **Ig gene conversion** process, that is a **key differentiation event** in avian B-cell development
- All **secondary lymphoid organs are fully colonized by 10-14 days of age**, with self sustaining B-cell population the **loss of the bursa after this age has minimal effect** on the immune competence of the affected animals.

PALYA, V., et al., 2015. 19th WVPA September 7th -11th 2015, Cape Town, South Africa

The importance of bursa fabricius

Results

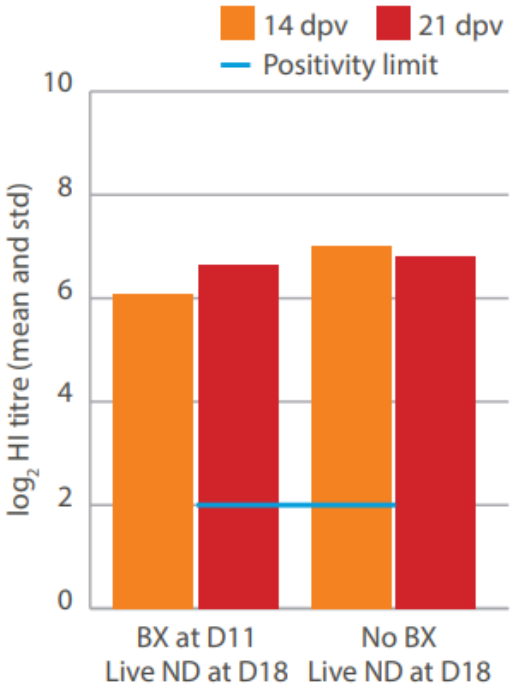


Fig. 1: Surgical BX at 11 DOA

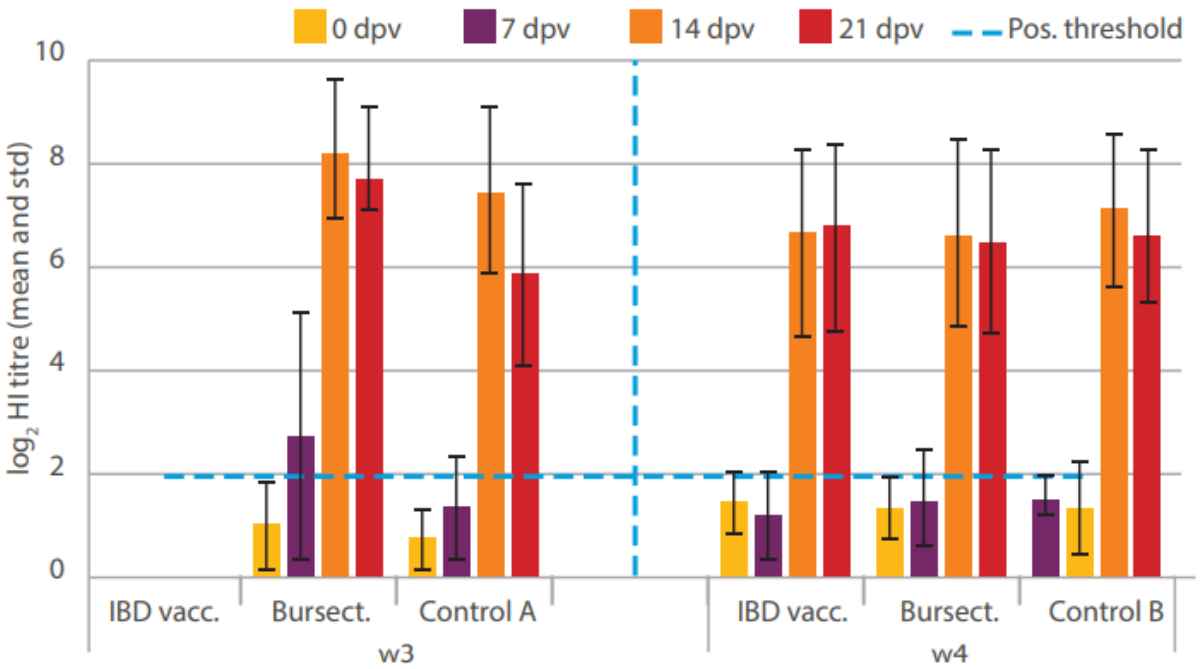


Fig. 2: Humoral immune response to ND vacc.

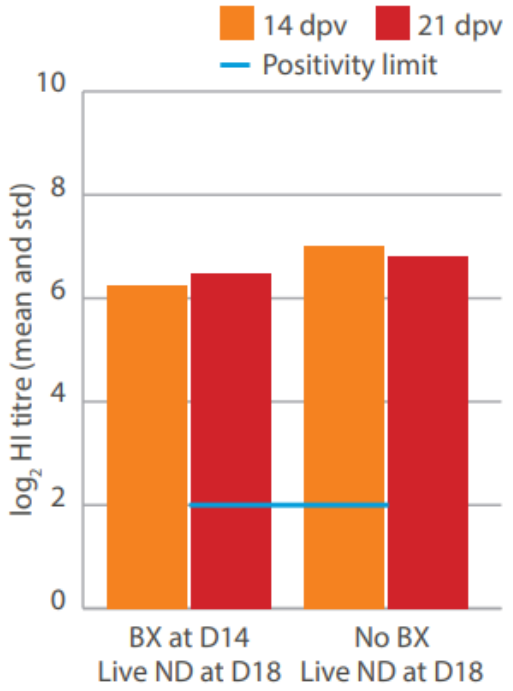


Fig. 3: Surgical BX at 14 DOA

- Humoral immune response to ND vaccination was slightly impaired when the bursectomy was performed at 11 DOA
- Humoral immune response to ND vaccination was no longer impaired when the bursectomy was performed at 14 DOA
- **These results suggest that the secondary lymphoid organs of chickens reach a state of development around 14 DOA when loss of bursal function due to bursectomy or IBDV infection does not adversely affect the development of humoral immune response**

Safety of Novamune®

NOVAMUNE

Safety

- SPF chickens
- 10x maximum release dose, sc route
- Histopathological scoring (0-5) according to Eur Ph scale

Table 8: Results of the histological examination of Bursa of Fabricius

Study days	Group 1 (vaccinated)		Group 2 (control)	
	Score	Repopulation signs	Score	Ph. Eur. limit
Day 7	2.2	0/5	0.0	-
Day 14	1.8	1/5	0.0	-
Day 21	0.6	5/5	0.0	≤2.0
Day 28	0.4	5/5	0.0	≤0.6

Scale: 0-5

Groups	Body weight (mean ± SD)	
	Day 0	Day 14
Vaccinated group	38.47±1.89	149.33±12.49
Unvaccinated control group	38.69±1.71	149.21±9.52
p-value	0.706	0.972

- There was **no death** or **any clinical signs** during the 14 days observation period.
- The animals remained **healthy**.

Safety of Novamune®

SPF birds
No MDA

Immunosuppression study:

- D1: Novamune sc
- D7: Cevac Uni L (timing of highest bursal damage), eye drop
- D21: ND HI serology & NDV challenge

	HI titre (log2)	Titre range	Positive/total	P-value
Group 1 (T004+Uni L)	4.59±1.01	1:8-1:128	22/22	0.091
Group 2 (Uni L)	4.14±0.71	1:8-1:32	22/22	
Group 3 (control)	0.00±0.00	negative	0/22	

Table 15: Protection rate against ND challenge

	Healthy	ND positive animals (sick and/or died)	Total	Protection
Group 1 (T004+ND vaccinated)	22	0	22	100 %
Group 2 (ND vaccinated)	22	0	22	100 %
Group 3 (control)	0	22	22	0 %

Safety of Transmune® in broiler breeder

Field assessment of an immune complex IBD vaccine in meat-type breeders

Marcelo Paniago[1], FabianoFabri[2], Jorge Chacón[2], Paulo Roberto Valério[3], Yannick Gardin[1]
[1]Ceva Santé Animale – France; [2]Ceva Saúde Animal – Brazil ; [3]Fricock Avicultura Industrial

Safety and efficacy of an immune-complex IBD vaccine (Cevac Transmune®) in broiler breeders

Kostas Koutoulis[1], Zeljka Ervacinovic[2], Nicolas Cousseau[2], Gema Ramon[1], Vilmos Palya[3]

[1]Ceva Animal Health, Libourne, France, [2]Ceva Animal Health, Amersham, UK [3]Ceva Phylaxia, Budapest, Hungary

Safety of Transmune® in broiler breeder

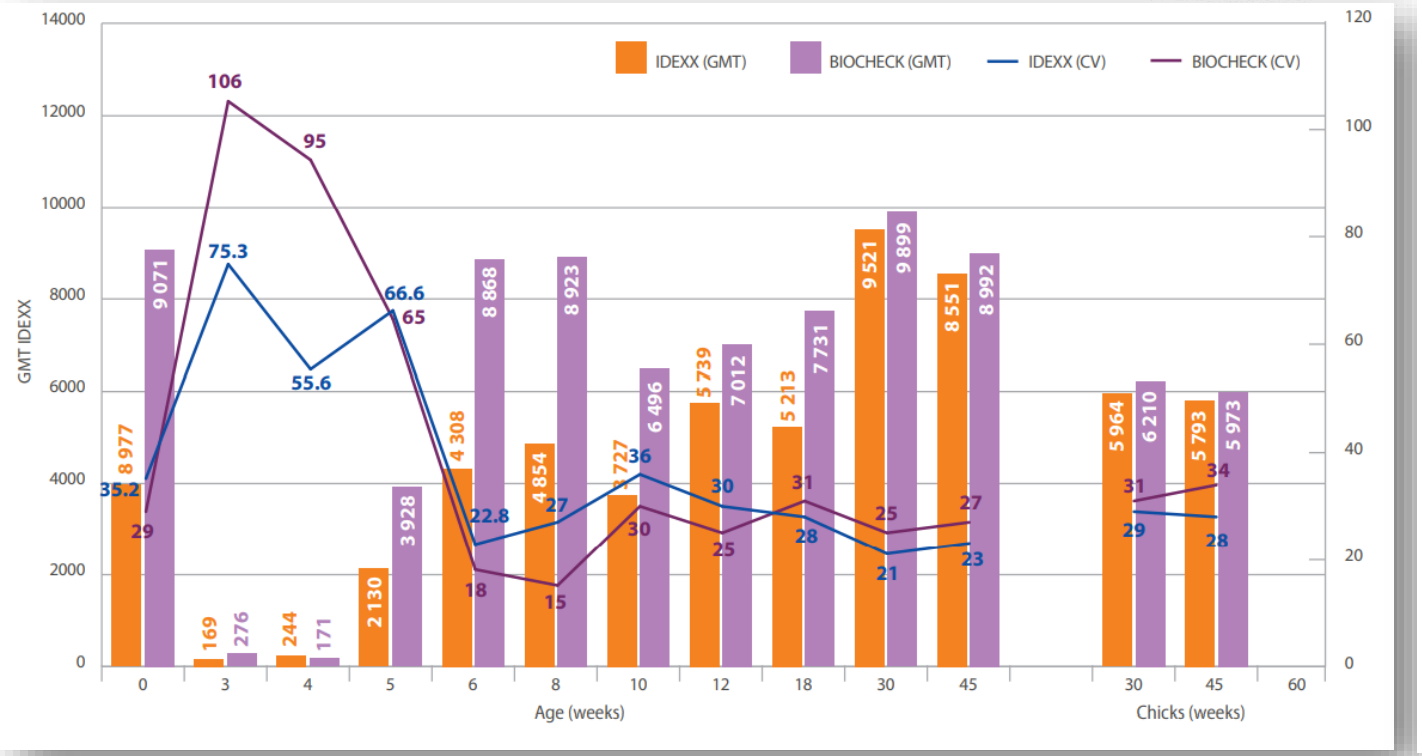
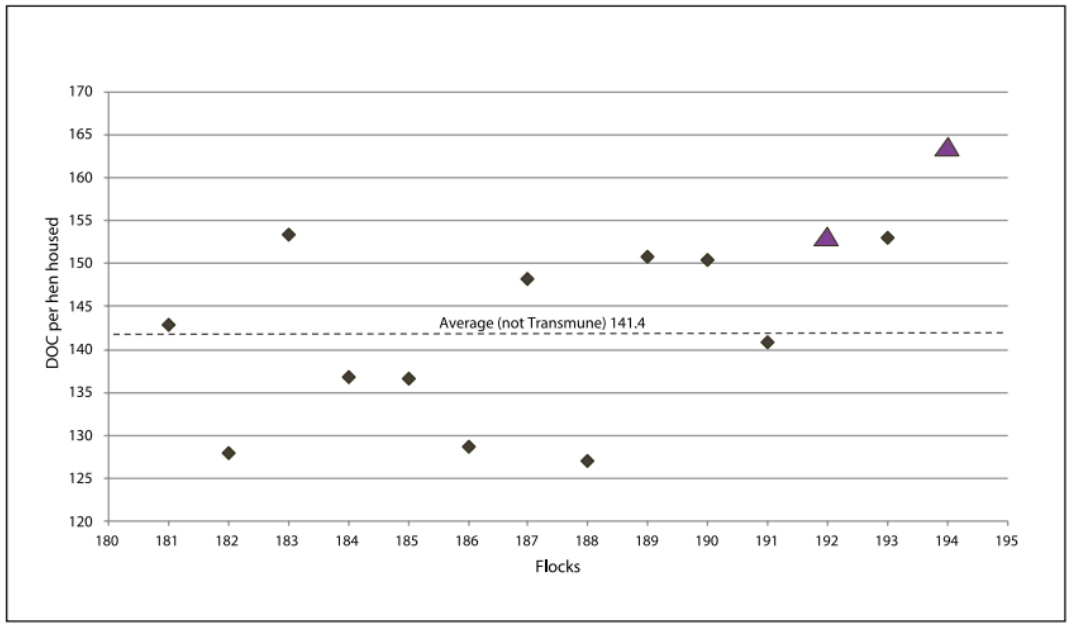


Figure 5: Chicks per hen house (66 weeks).

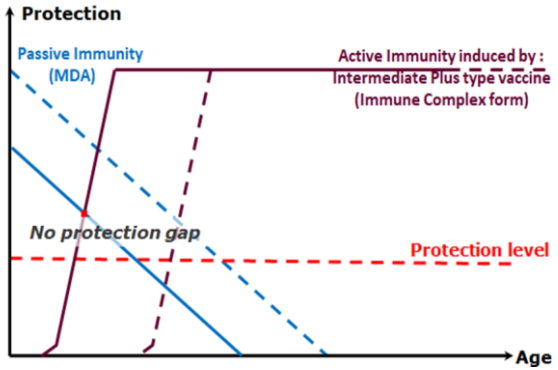


- Transmune at one day of age by subcutaneous route then at week 21, vaccinated with inactivated IBD vaccine (at week 21).
- In summary, the average production of the 12 previous flocks housed in the same farm was 141.4 day-old chicks per hen housed at 66 weeks of age. Flocks 192 and 194 produced 152.8 and 163.4 DOC,

Safety of Transmune® versus Naked IBD MB strain



Transmune is an **Immune-complex**



Transmune is **SAFE**

« **Different vaccine technologies**»

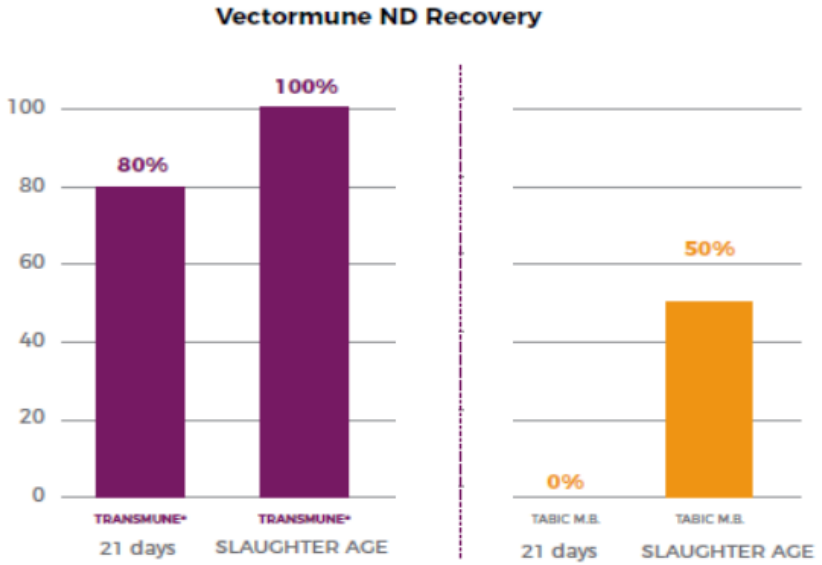
a naked IBD live virus – MB strain

Depends on MDAs to be coated after the injection and prevent too early replication in the young chick´s bursa

???

BURSAL REPLICATION OCCURS

VERY EARLY



Naked virus IBD for hatchery vaccination

SSIU Phylaxia Study SSR. Id. number: 2018/21, December 17th 2018

- Naked IBD (MB strain) was used for SQ immunization of SPF chickens at 1 DOA or 10 DOA
- ND vaccine was applied at 14 DOA and humoral immune response to ND vaccination was measured at 21 days post vaccination, to test the possible immunosuppressive effect of an infection with a naked IBD (MB strain) at an early age. Histology of the bursal lesions was performed

GROUP	Vaccination with MB1 IBDV (1/dose/sc./chick)	Vaccination with Hitchner B1 (1 dose/chick oculo-nasally)	No. of animals	Sampling
1	D0	D14	40	• **3 days post IBD vaccination***: (n=10 in vaccinated, n=3 in control group) • Bursa sampling for histology • **21 days post ND vaccination**: (n=20-22/group) • Blood sampling • Bursa histology
2	D10		35	
3	———		22	
4	———	———	20	

Naked virus for hatchery vaccination

BURSA REGENERATION

- Less than half of the follicles regenerated in the chickens vaccinated with a naked IBD (MB strain) vaccine at D0. In 90% of them, less than 30% of follicles showed lymphocyte repopulation
- Following vaccination at D10, in 80% of chickens, more than half of the follicles regenerated, indicating markedly better regeneration compared to the effect observed after day-old administration of a naked IBD (MB strain)

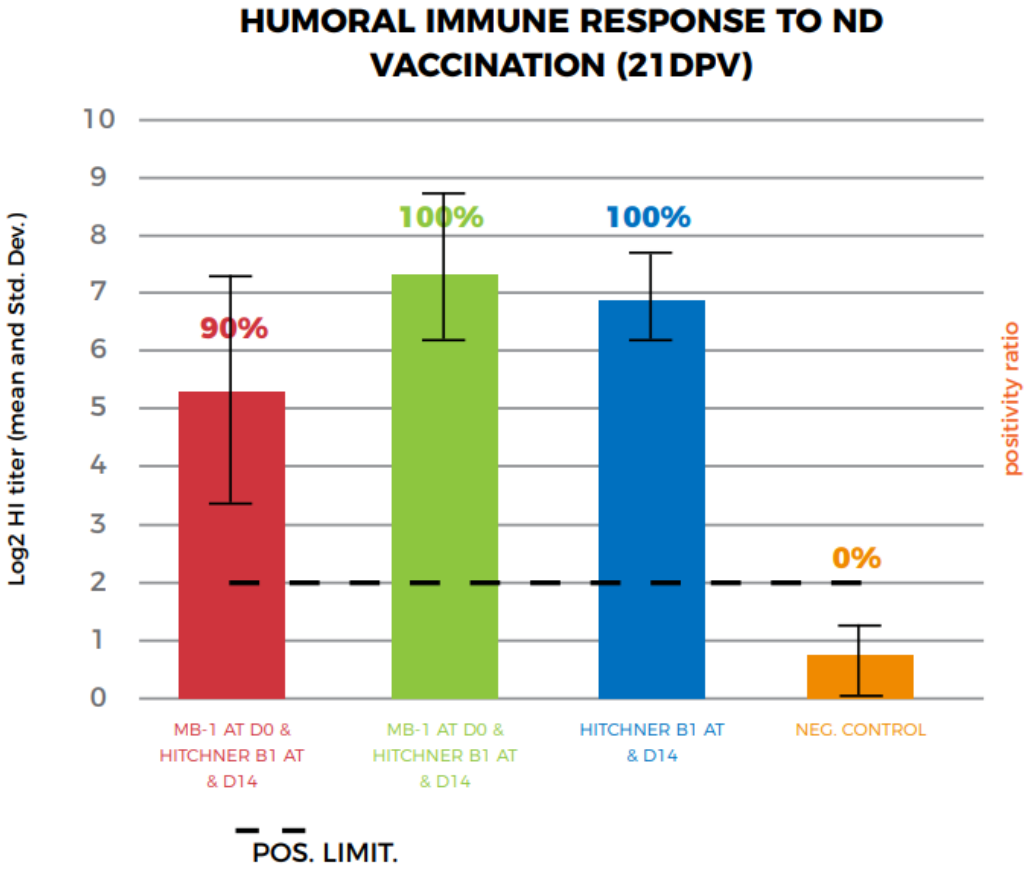
HISTOLOGICAL LESIONS AT 35 DAYS OF AGE

RATIO OF REGENERATED FOLLICLES	MB1 AT D0	MB1 AT D10	NO MB1	NEG. CONTROL
<30%	90%	20%		
30 - 50%	10%	---	NO LESIONS	NO LESIONS
50 - 70%	---	80%		
>70%	---	---		

Naked virus for hatchery vaccination

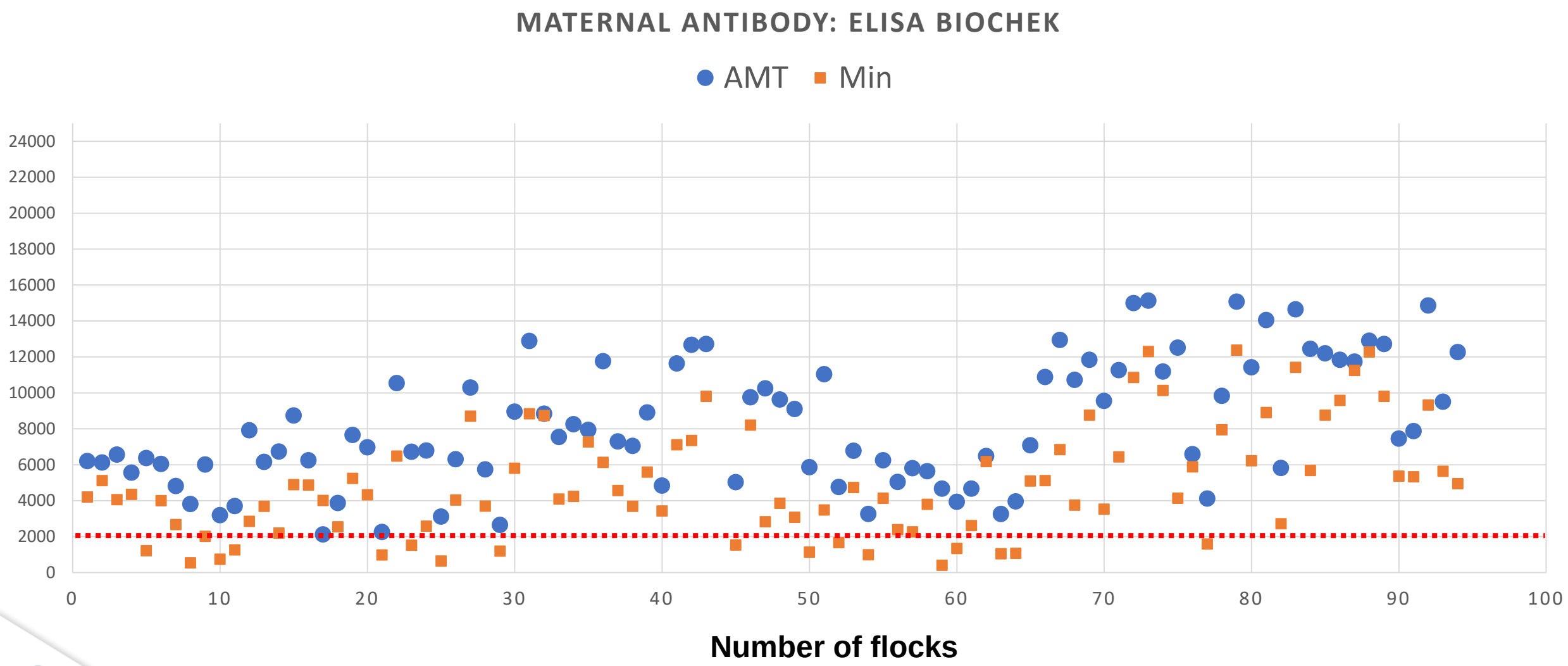
BURSA REGENERATION

- ND vaccination of chickens at 2 weeks of age, following day-old vaccination with a naked IBD (MB strain), resulted in significantly lower humoral immune response to NDV, compared to the non-IBD vaccinated control group.
- On the contrary, in the group vaccinated with a naked IBD (MB strain) at 10 DOA, the immune response to ND vaccination, measured at 4 days post-vaccination, was similar to the non-vaccinated control chickens.
- Some individual birds in the 1 DOA vaccinated a naked IBD (MB strain) group showed strong immunosupression.



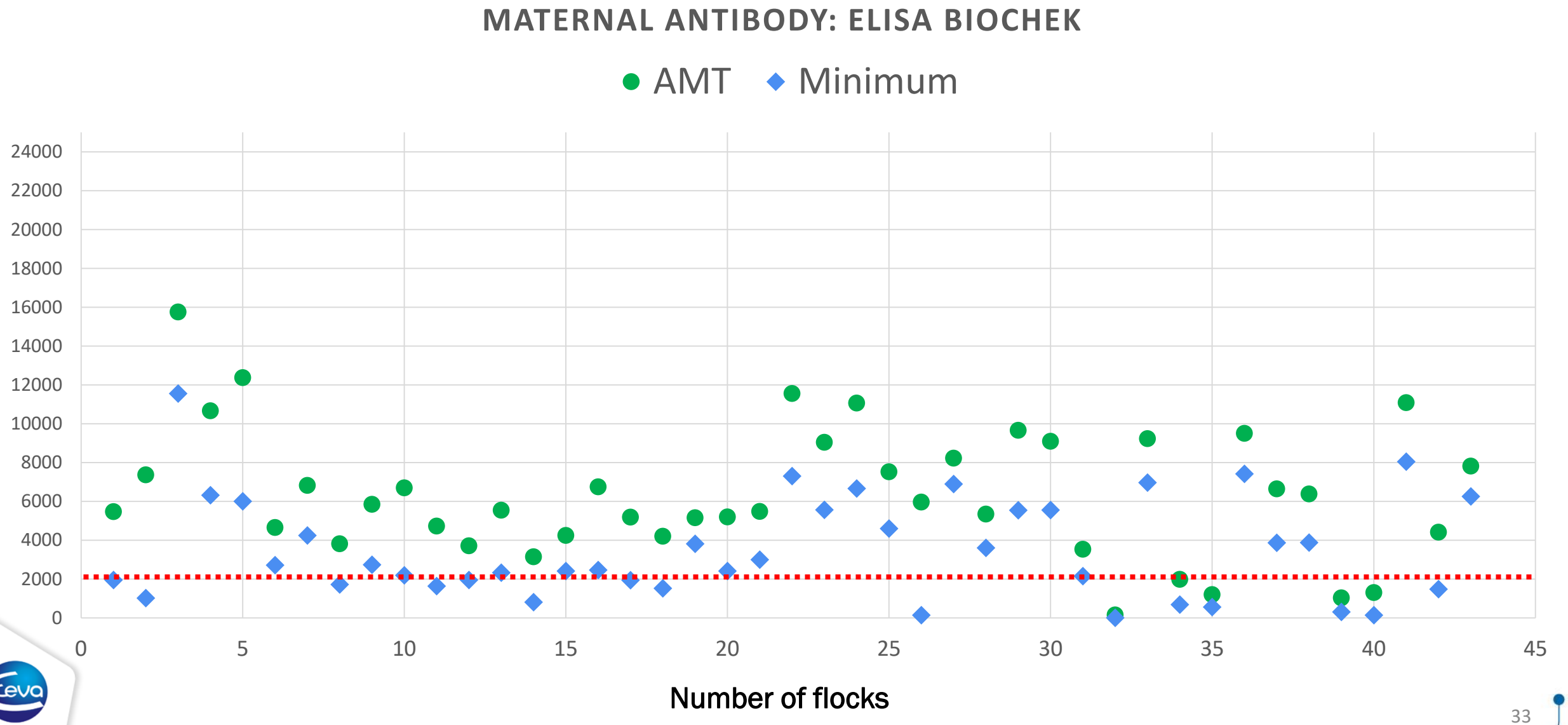
Maternal Antibody
Layer commercial

Indonesia



Maternal Antibody
Broiler commercial

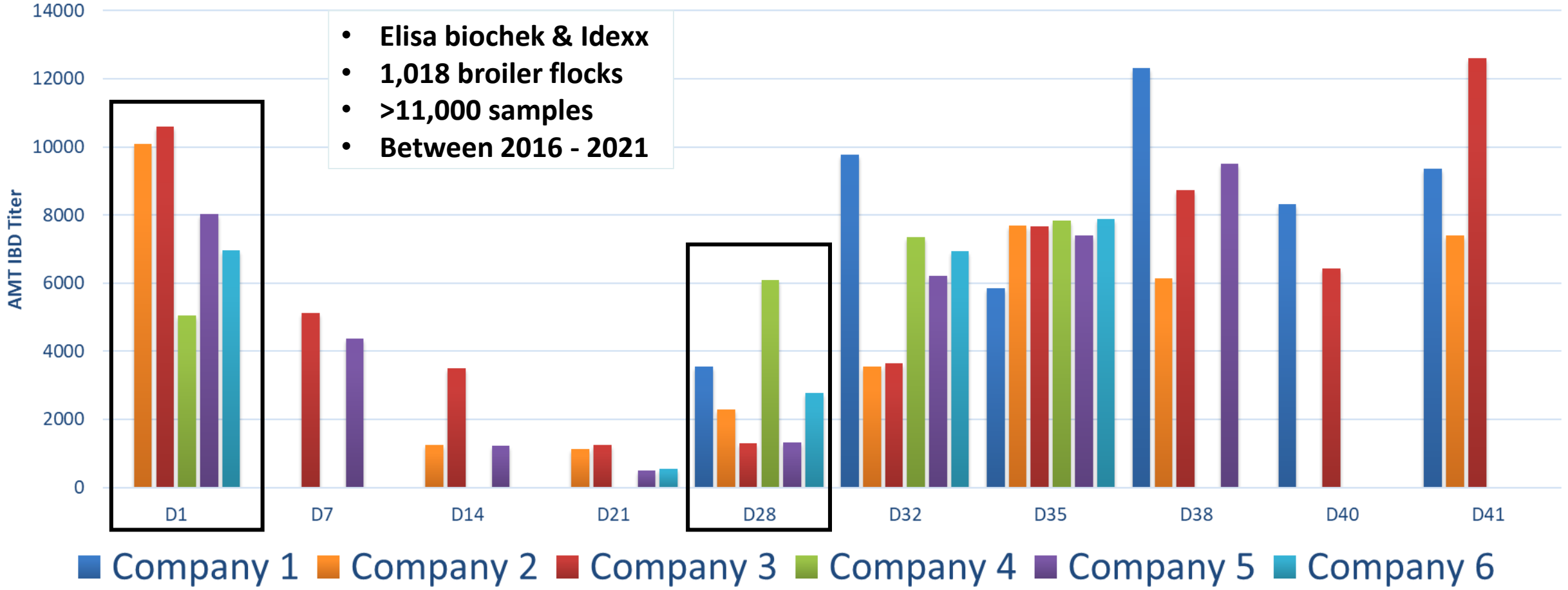
Indonesia



Efficacy of IBD hatchery vaccines

Efficacy of Transmune®

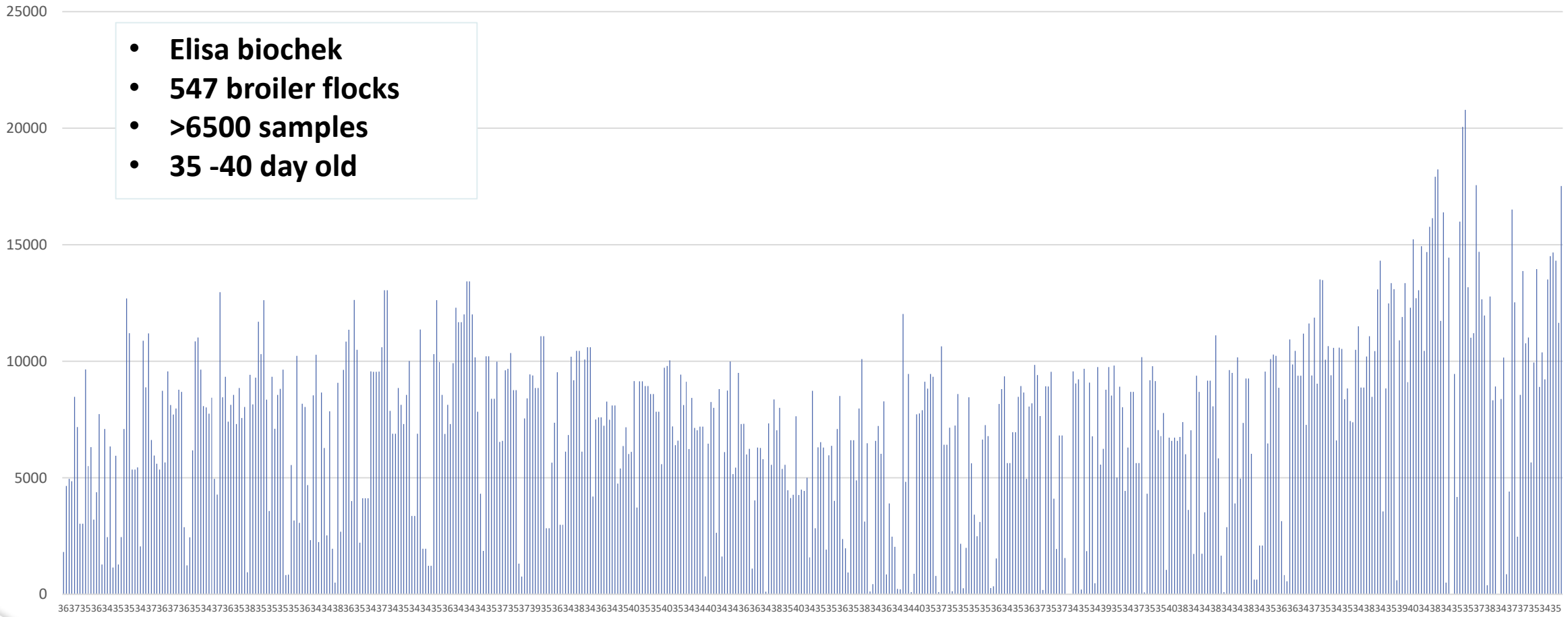
Indonesia



Efficacy of Transmune®

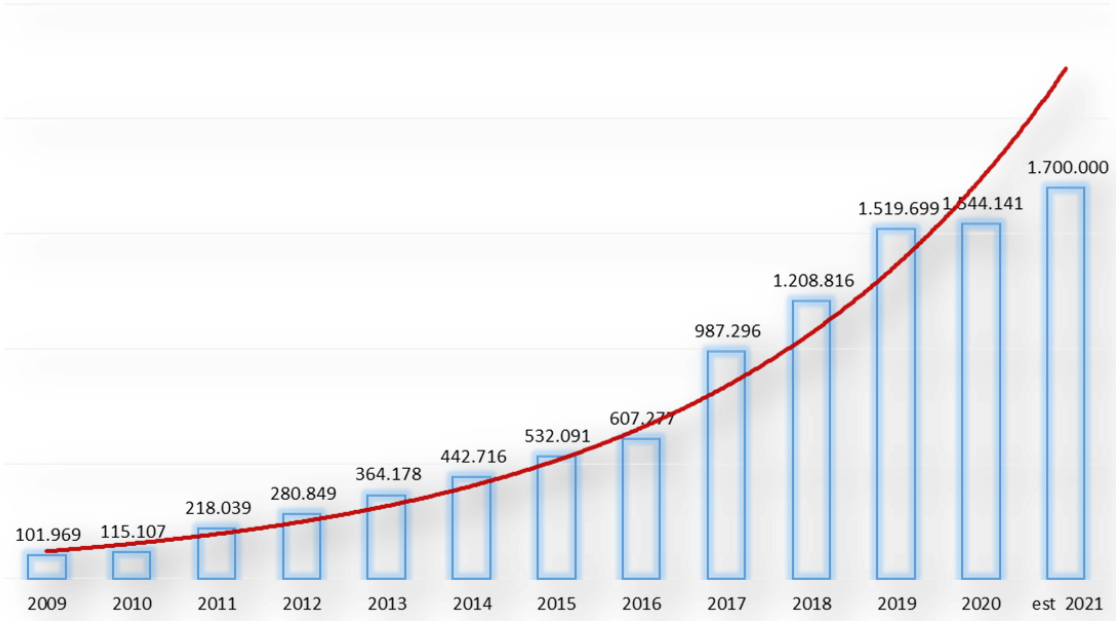
Indonesia

IBD titres during harvest between 2015 - 2021

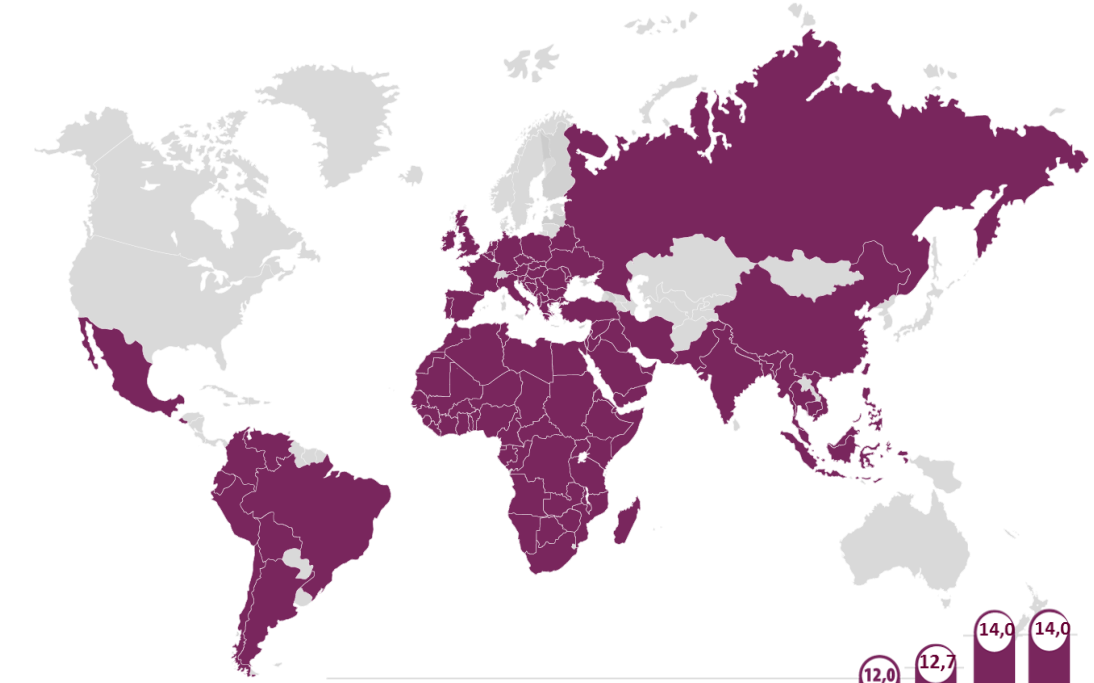


Efficacy of Transmune® Indonesia & worldwide

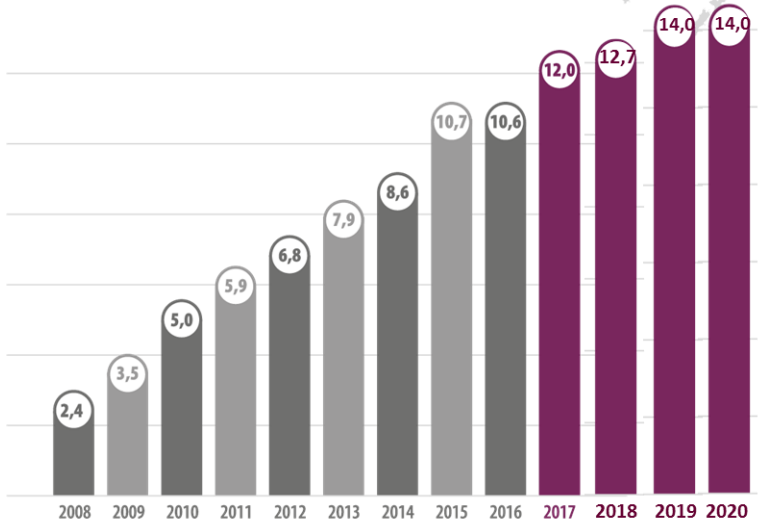
TRANSMUNE
LEADERSHIP



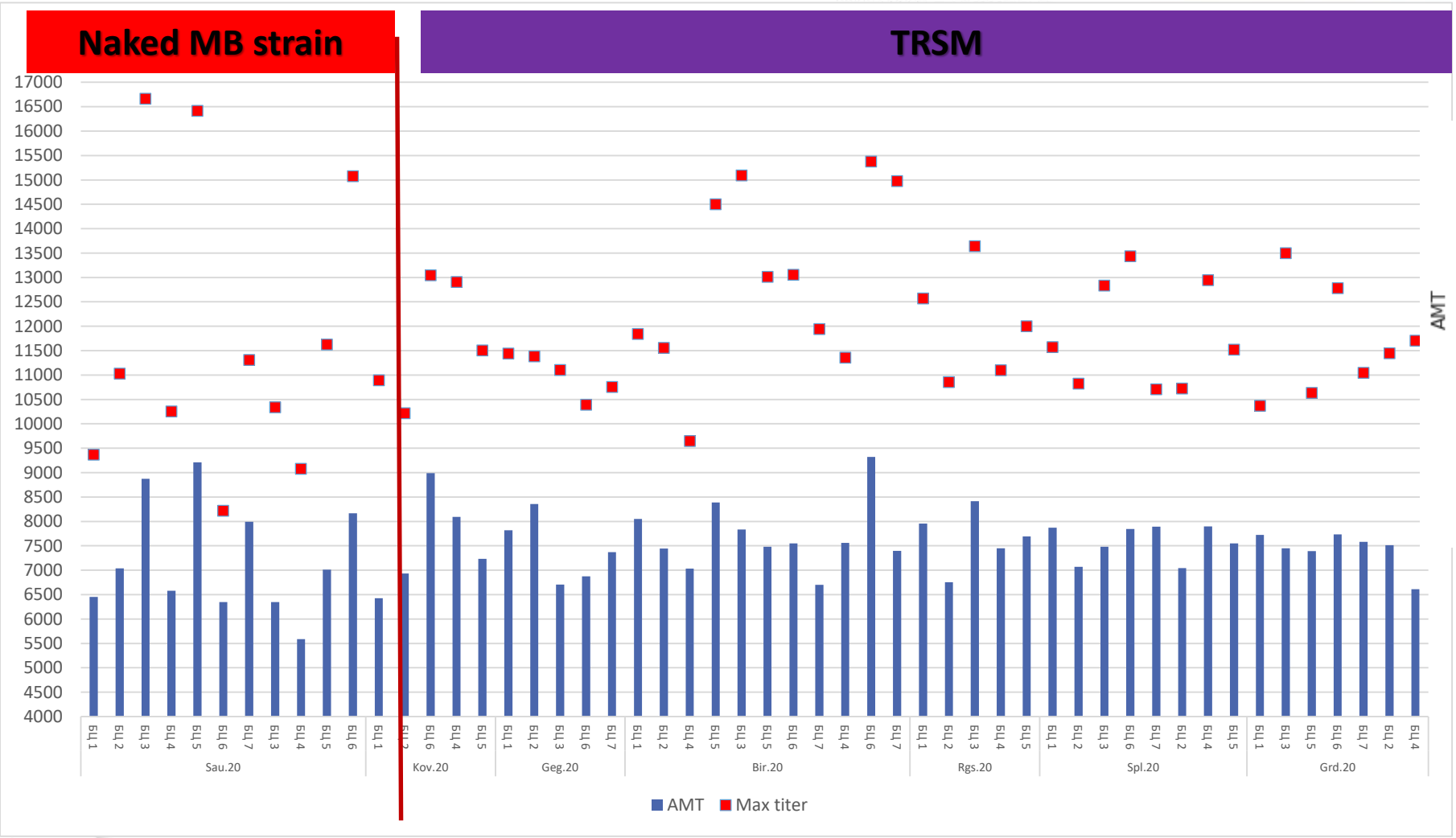
Evolution in Indonesia

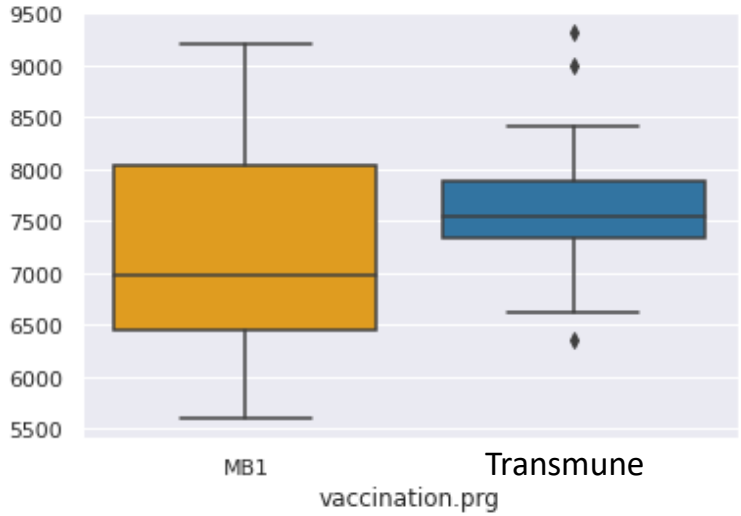


120 billion



Demonstrate better uniformity of Transmune protection





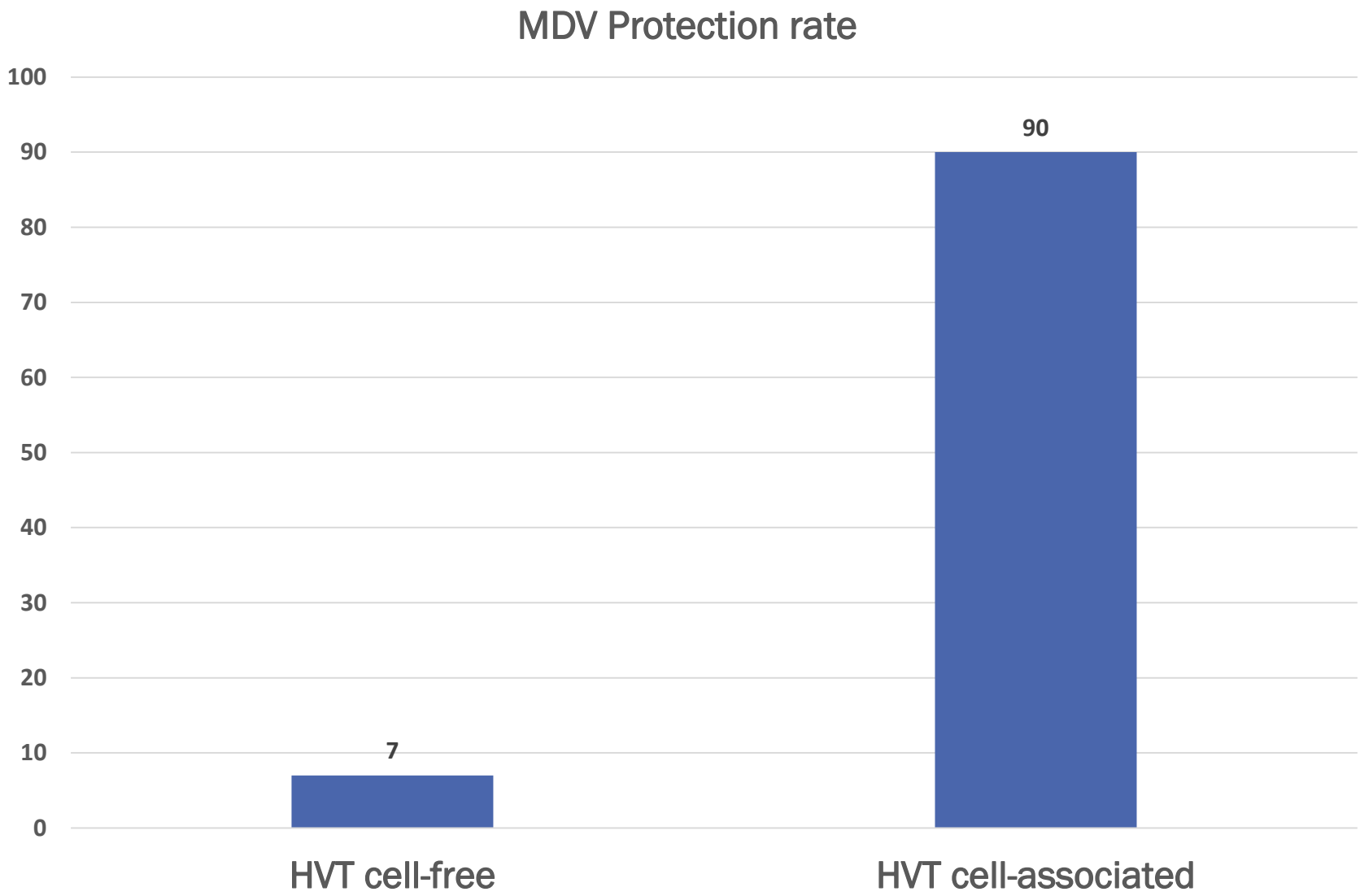
Demonstrate better performance of Transmune

House	1	4	2	5
	MB1	**TRSM**	MB1	**TRSM**
Age of breeders	25,26,31,36 ,41	**26,27,32,34 ,38**	36,39,47,51 ,59	**31,32,34,51 ,52**
Birds placed	212160	**208965**	214092	**205020**
Birds per sq.m	23	**23**	24	**23**
Slaughter age	37,7	**39,4**	38,3	**39,1**
Livalibility (%)	91,2	**92,7**	90,8	**92,8**
ABWG	61,7	**63,5**	62,1	**62,7**
ABW	2357	**2534**	2415	**2486**
FCR	1,659	**1,653**	1,69	**1,675**
EPEF	343,69	**360,68**	338,78	**352,26**

	Total		
Groups	MB1	**TRSM**	+/-
Birds placed	426 252	**413 985**	**- 12 267**
Birds per sq.m	23,5	**23**	**- 0,5**
Slaughter age	38	**39,25**	+ 1,25
Livalibility (%)	91	**92,75**	**+ 1,75**
ABWG	61,9	**63,1**	**+ 1,2**
ABW	2386	**2510**	**+ 124**
FCR	1,67	**1,66**	**- 0,01**
EPEF	341,23	**356,45**	**+ 15,22**
Live weight, kg	925 503,92	**963 767,43**	**+ 38 263,51**

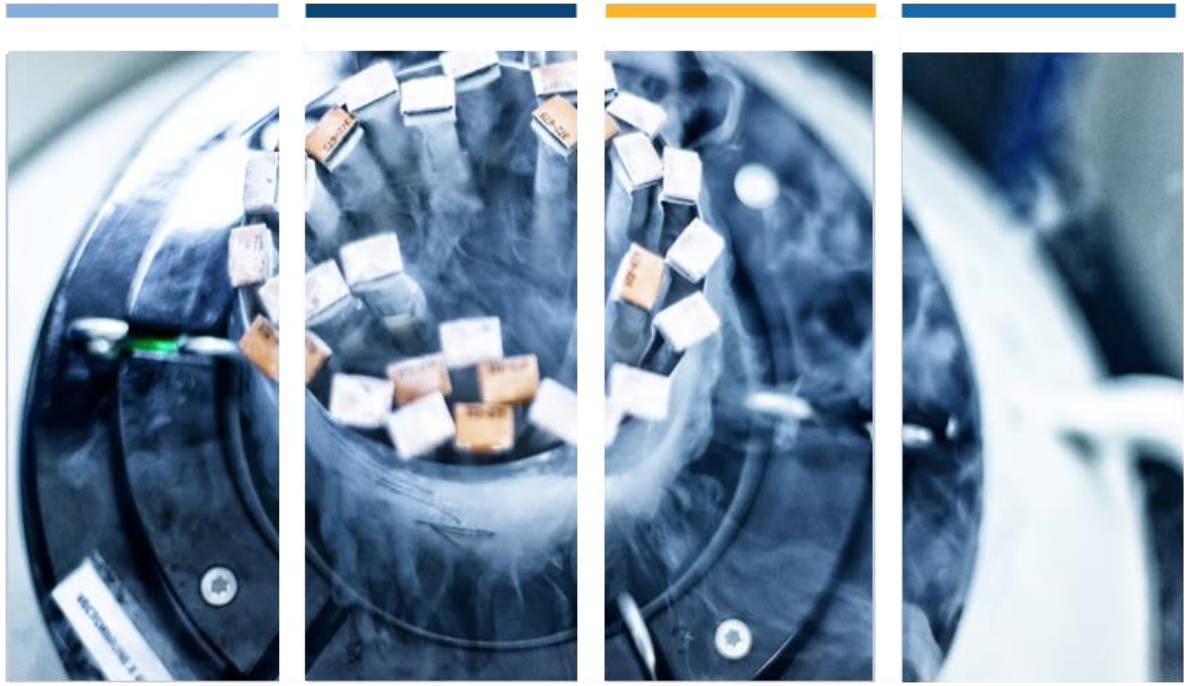
+ 38 263 Kg more!

MDA interference / Marek’s disease



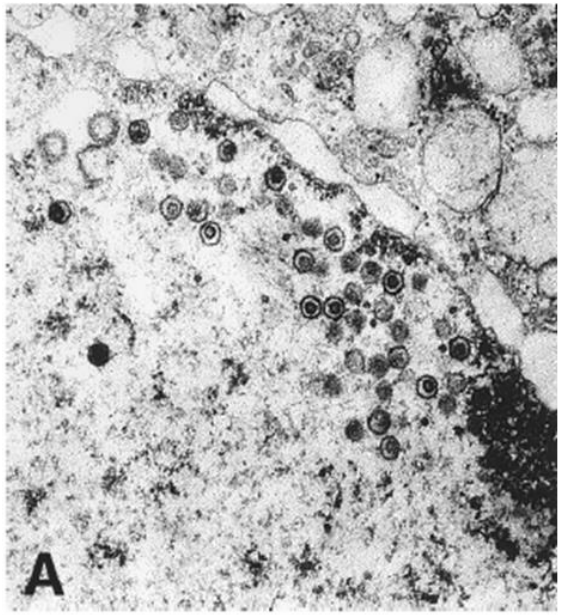
Sharma JM and CK Graham, 1982, Av Dis 26; 860-870.

Marek’s disease vaccination: the solution



Keeping Marek's vaccines in frozen 'cell-associated' form

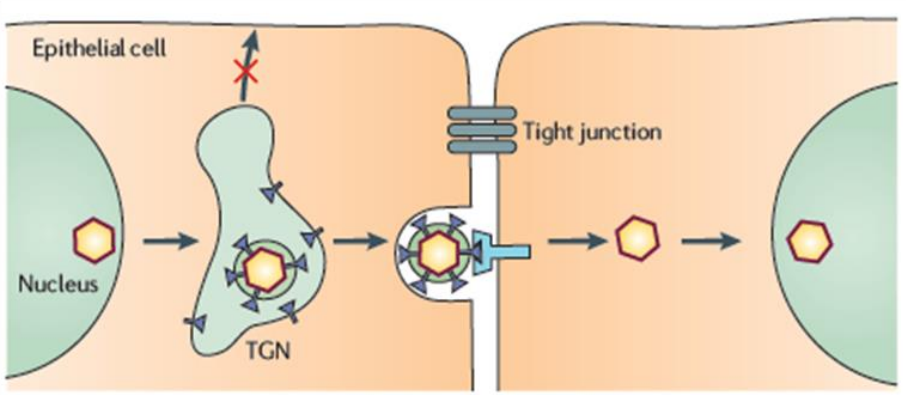




MDV in nucleus

R.L. Witter and K.A. Schat

Cell to cell spread of herpesvirus

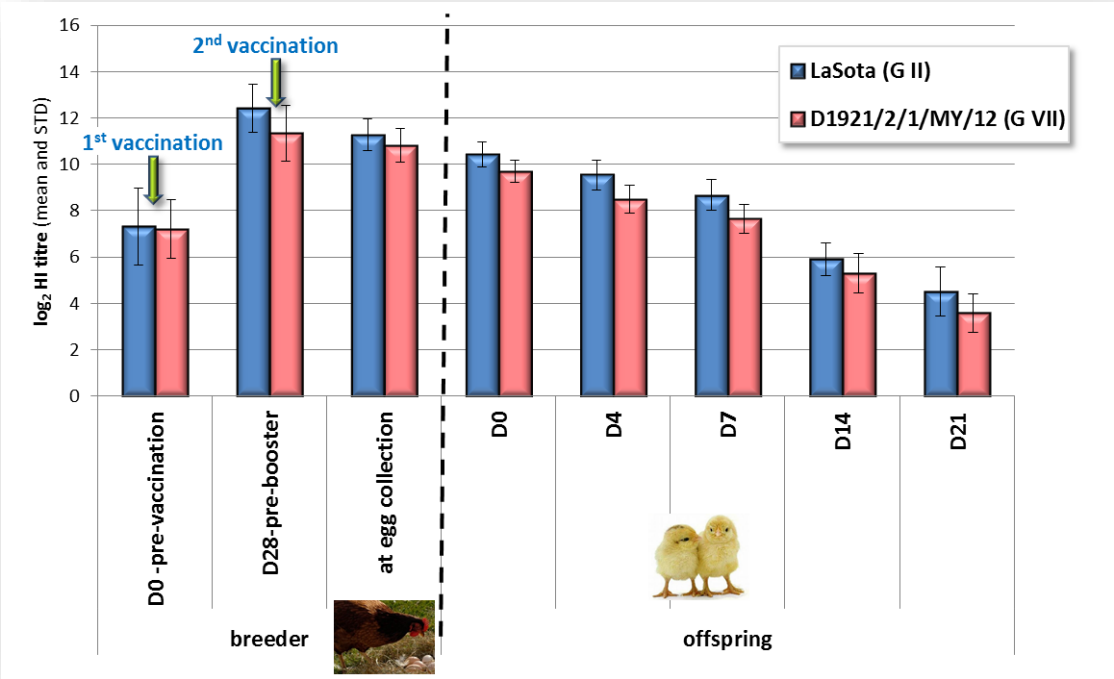


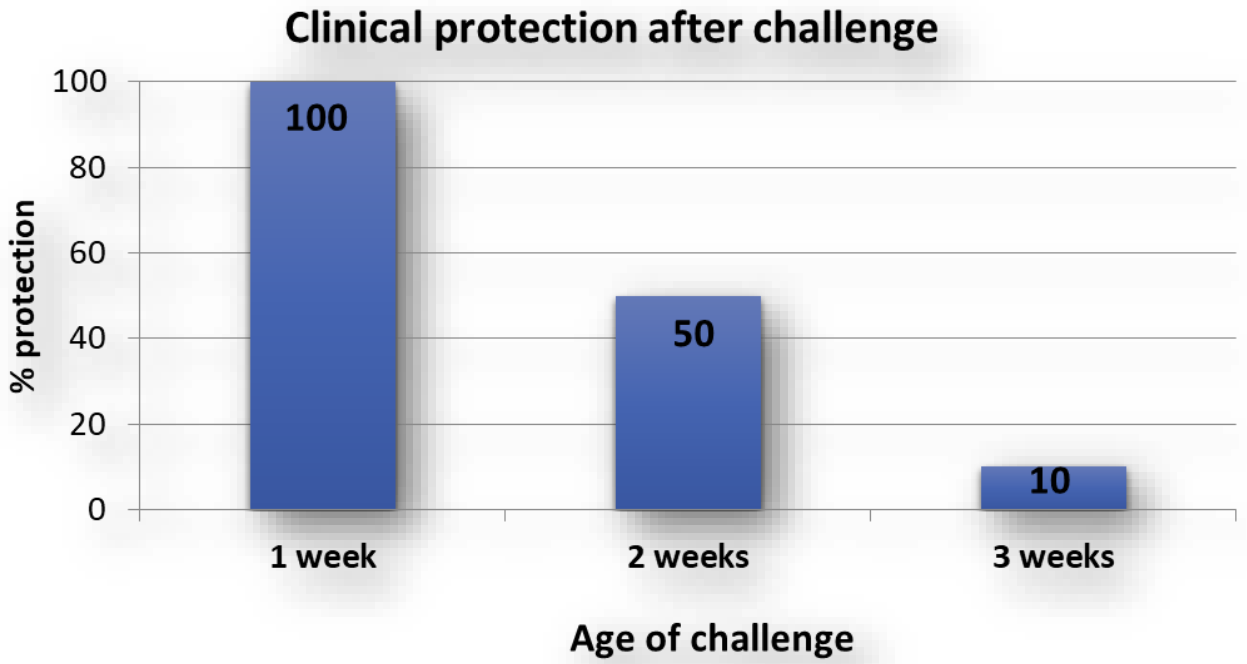
D.C. Johnson and J.D. Baines

MDA interference / Newcastle disease

MDA^{NDV} and Early protection

- Breeders: Ross 308, purchased from commercial source at 15 weeks of age, these breeders immunized ND inactivated on W16 and W20
- Day old broilers: hatched in the early stage of egg-production then the challenge with Genotype VIIi on W1,W2 and W3

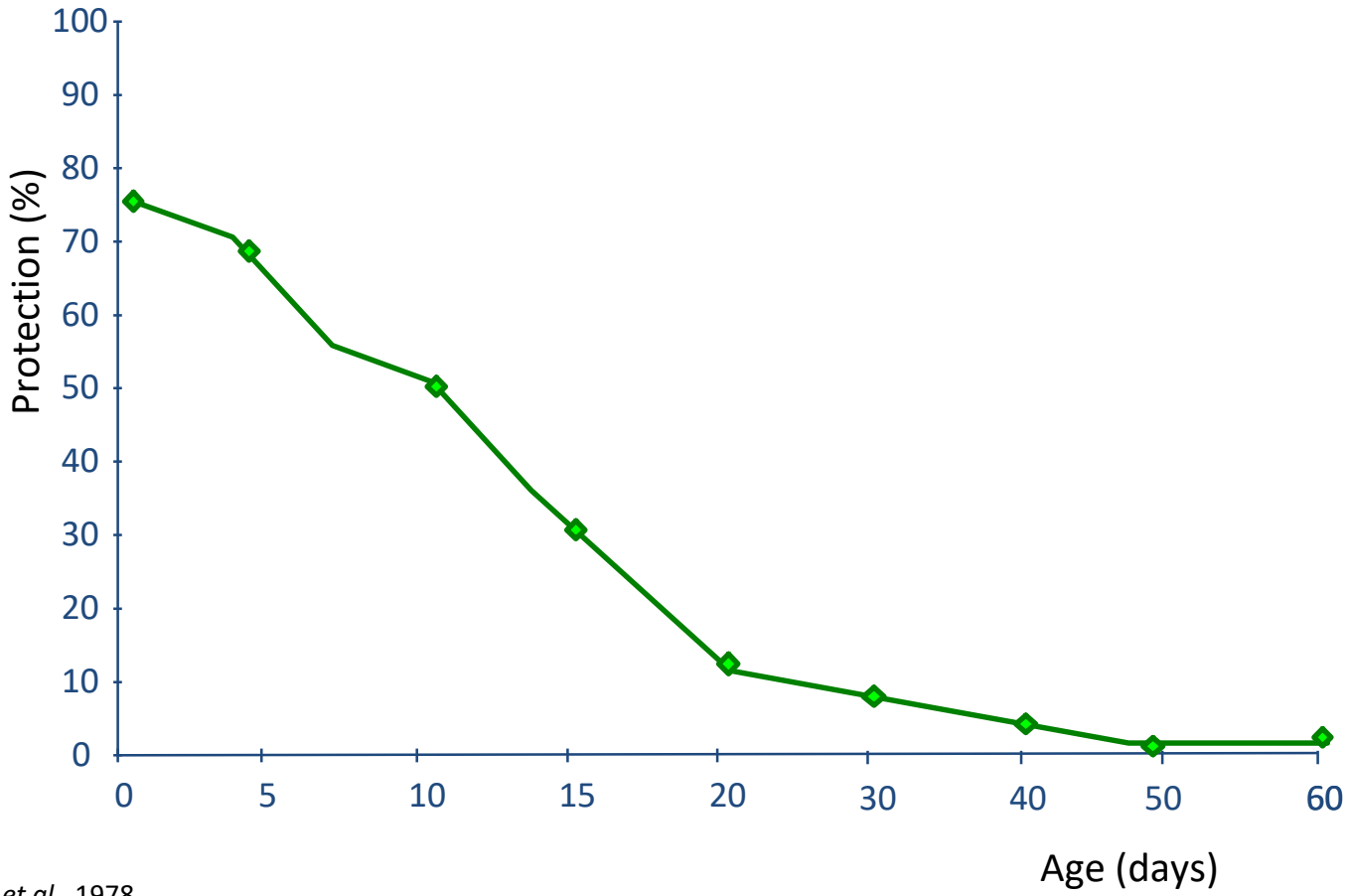




Source: SSIU Phylaxia, 2014

Interference with MDA^{NDV}

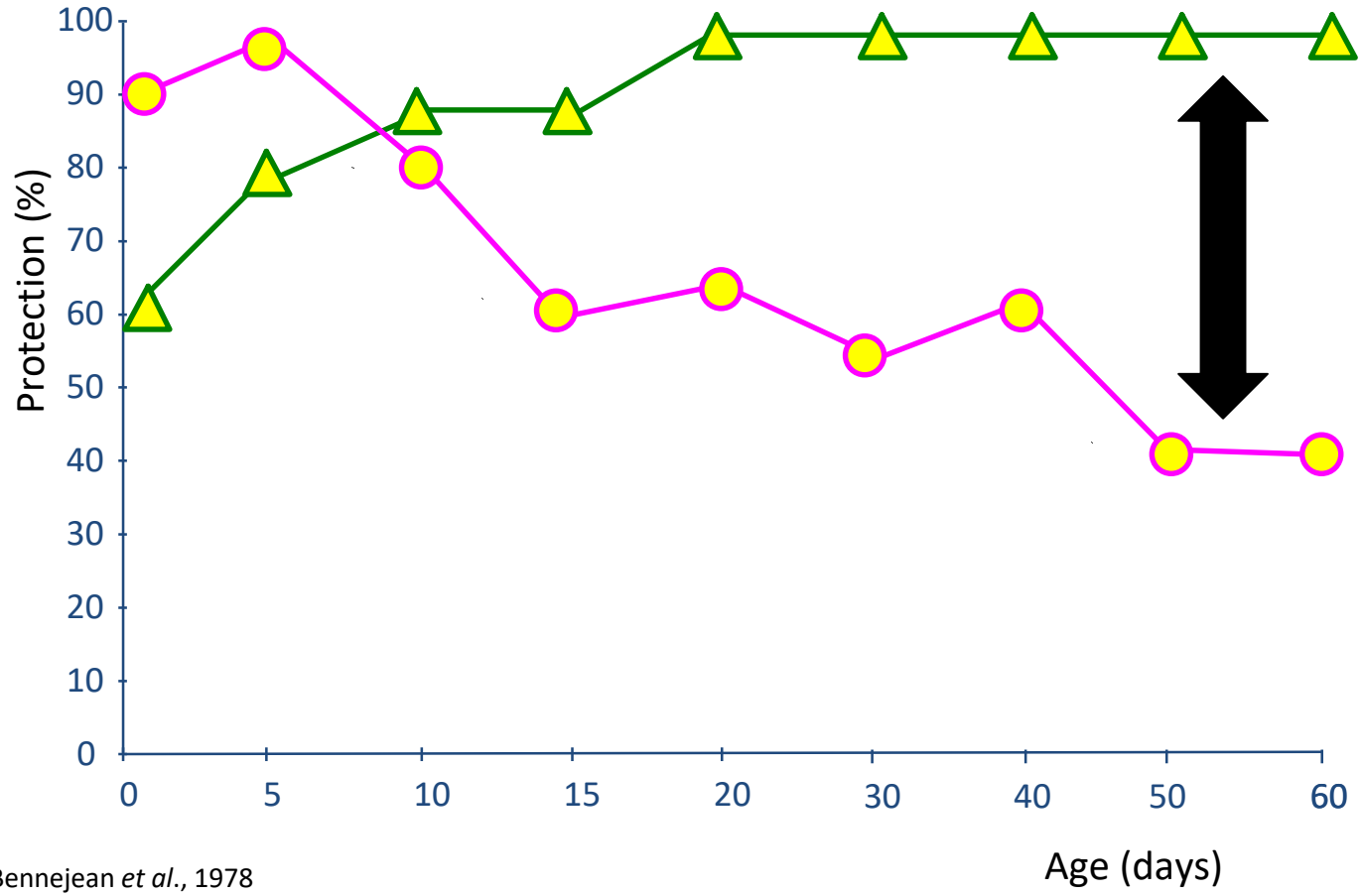
% protection / challenge



Source: Bennejean *et al.*, 1978

Interference with MDA^{NDV}

% protection / challenge



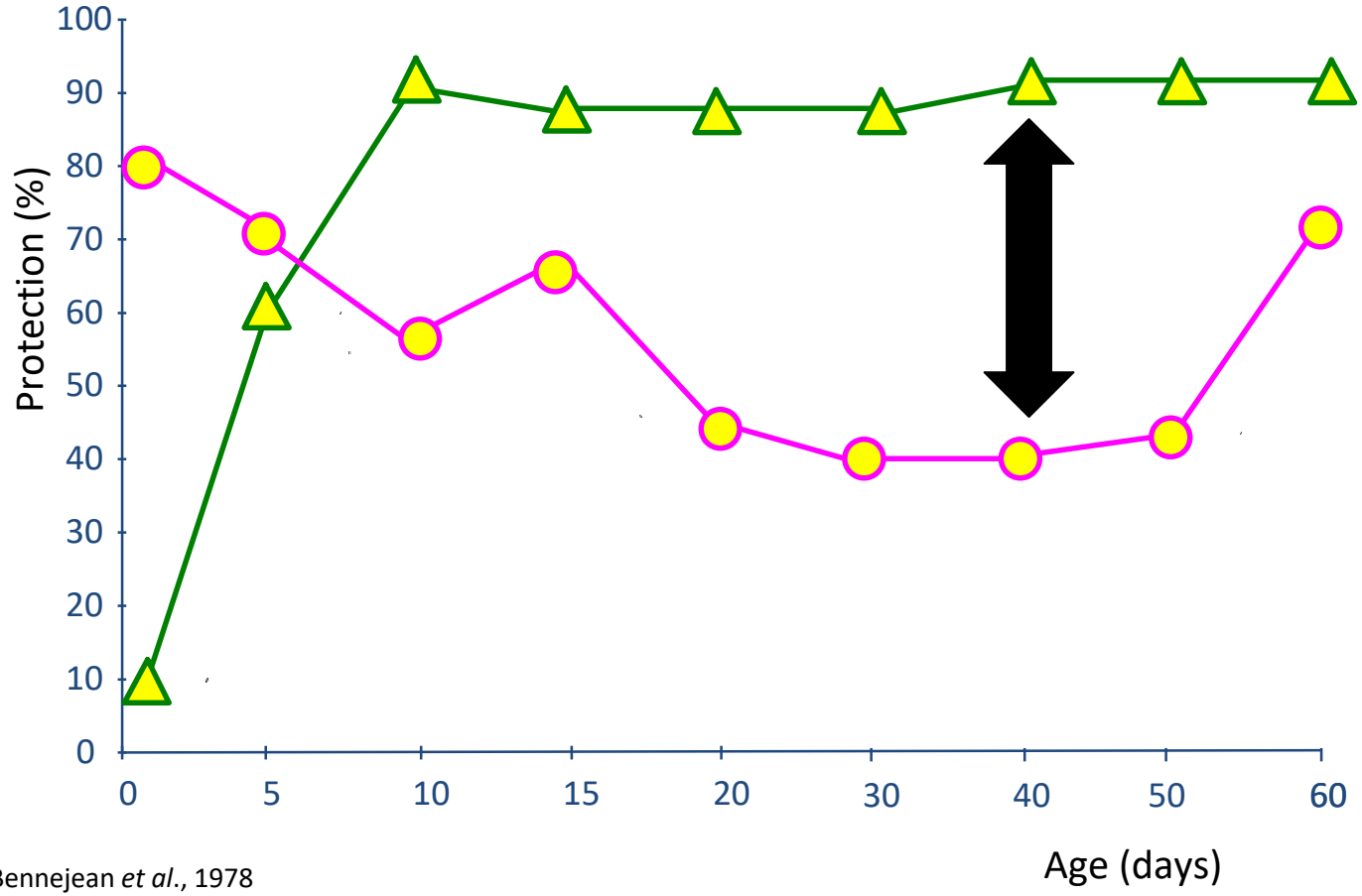
Live vaccines

Chickens	MDA	
	With	Without
Vaccinated	●	▲

Source: Bennejean *et al.*, 1978

Interference with MDA^{NDV}

% protection / challenge



Inactivated vaccines

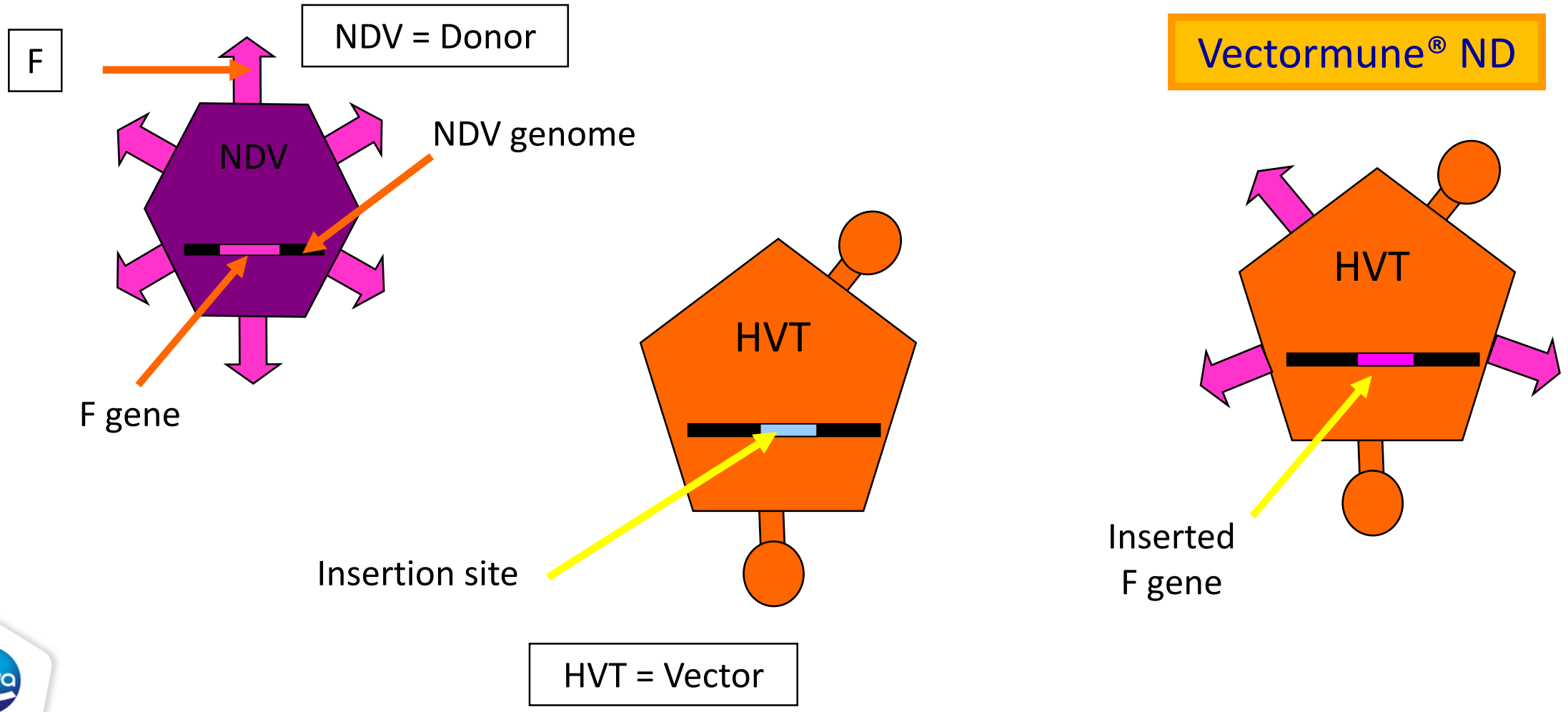
Chickens	MDA	
	With	Without
Vaccinated	○	△

Source: Bennejean *et al.*, 1978

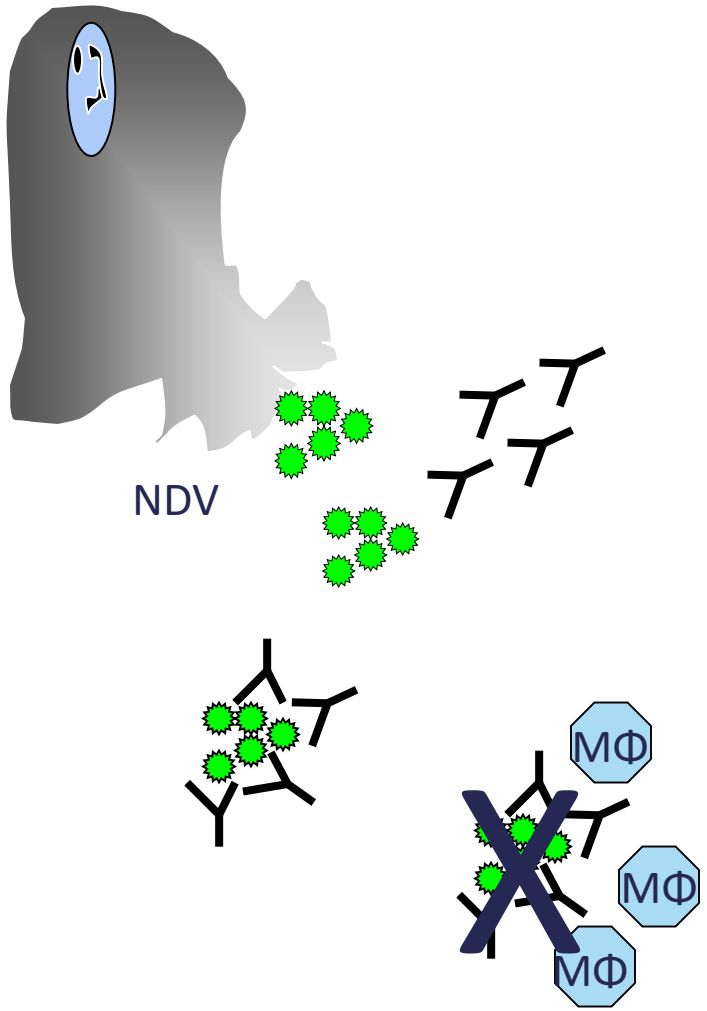
Newcastle disease vaccination: the solution



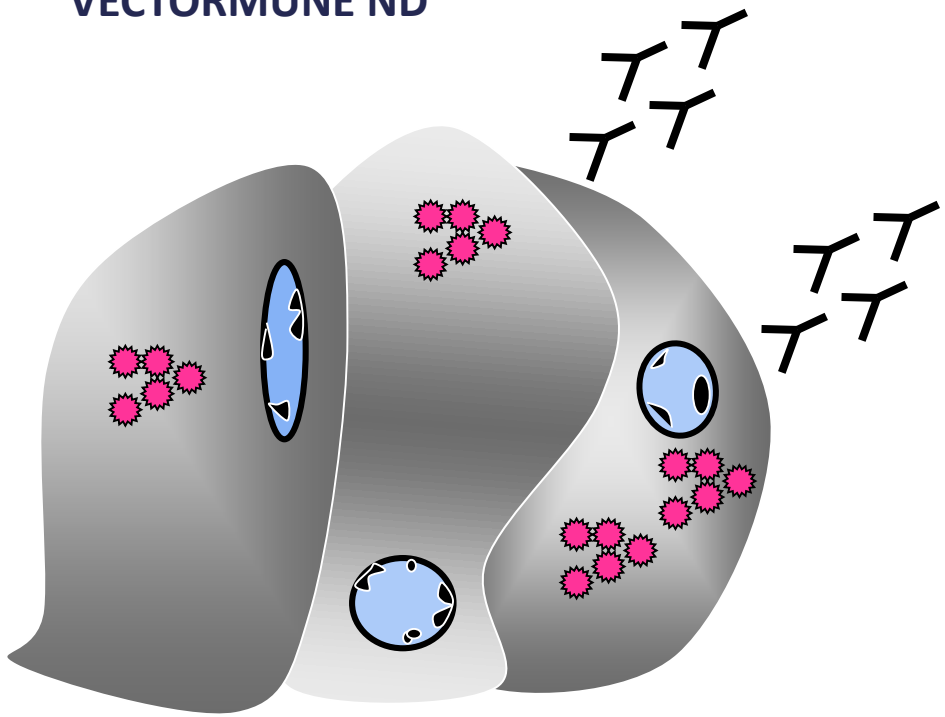
Vectormune® ND



Traditional NDV Vaccine



VECTORMUNE ND



From: Moore Dorsey K.

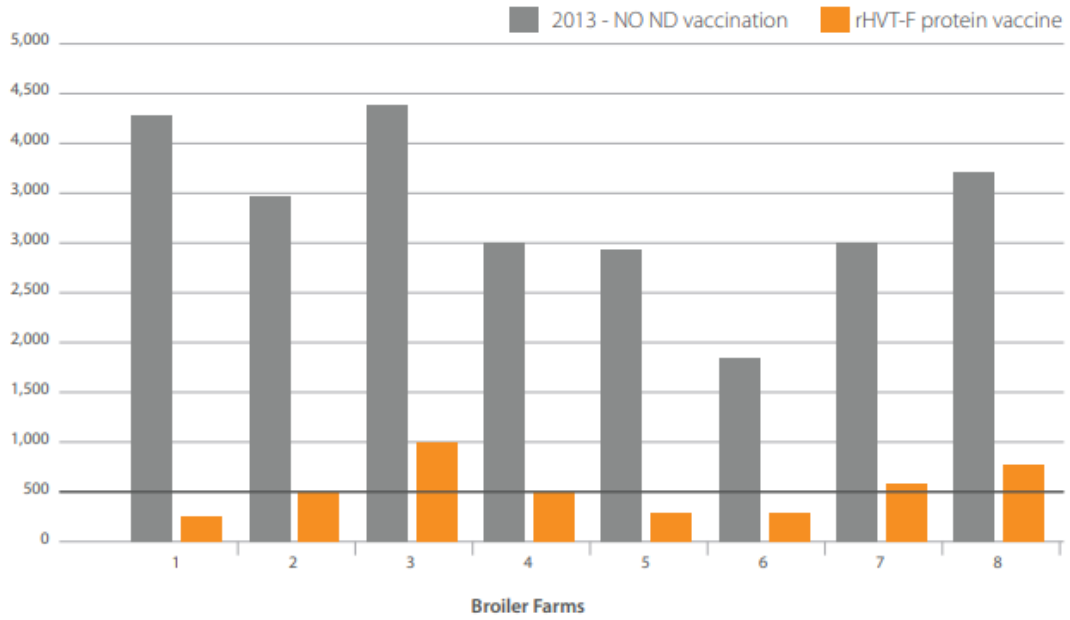
Safety of Vectormune ND®

In Brazil, ND has not been reported in commercial poultry over the last 20 years. As a consequence. The majority of the broiler production, including in the Southern densely populated poultry area is not vaccinated against ND.

Trial 1	Controls	Vaccinated
ND vaccination	None	Vectormune® ND
Population	902,000	943,000
Market age (days)	35.2a	37.6a
Mortality (%)	3.5a	3.17a
Final body weight (kg)	1.98a	2.17a
Average daily gain (g)	54.5a	55.8a
Feed conversion rate	1.62a	1.67a
Production index	322a	321a

a,b: different letters ant difference ($p<0.05$)

Control group: Not vaccinated any ND vaccines



Idexx ELISA profile in 2013 clearly showed that the 8 broiler flocks (non vaccinated against ND) have met ND virus (probably a live vaccine spread from neighboring layer and breeder farms)

SESTI L. et al., 2016. Productivity, clinical performance and seroconversion of broilers vaccinated with a vector rHVT-F protein Newcastle Disease (ND) vaccine and reared in non-vaccinating and velogenic ND virus (vNDV)-free poultry companies. *American Association of Avian Pathologists (AAAP) meeting, San Antonio, TX, August 6-9.*

Maternal Antibody of mareks and Vectormune ND®

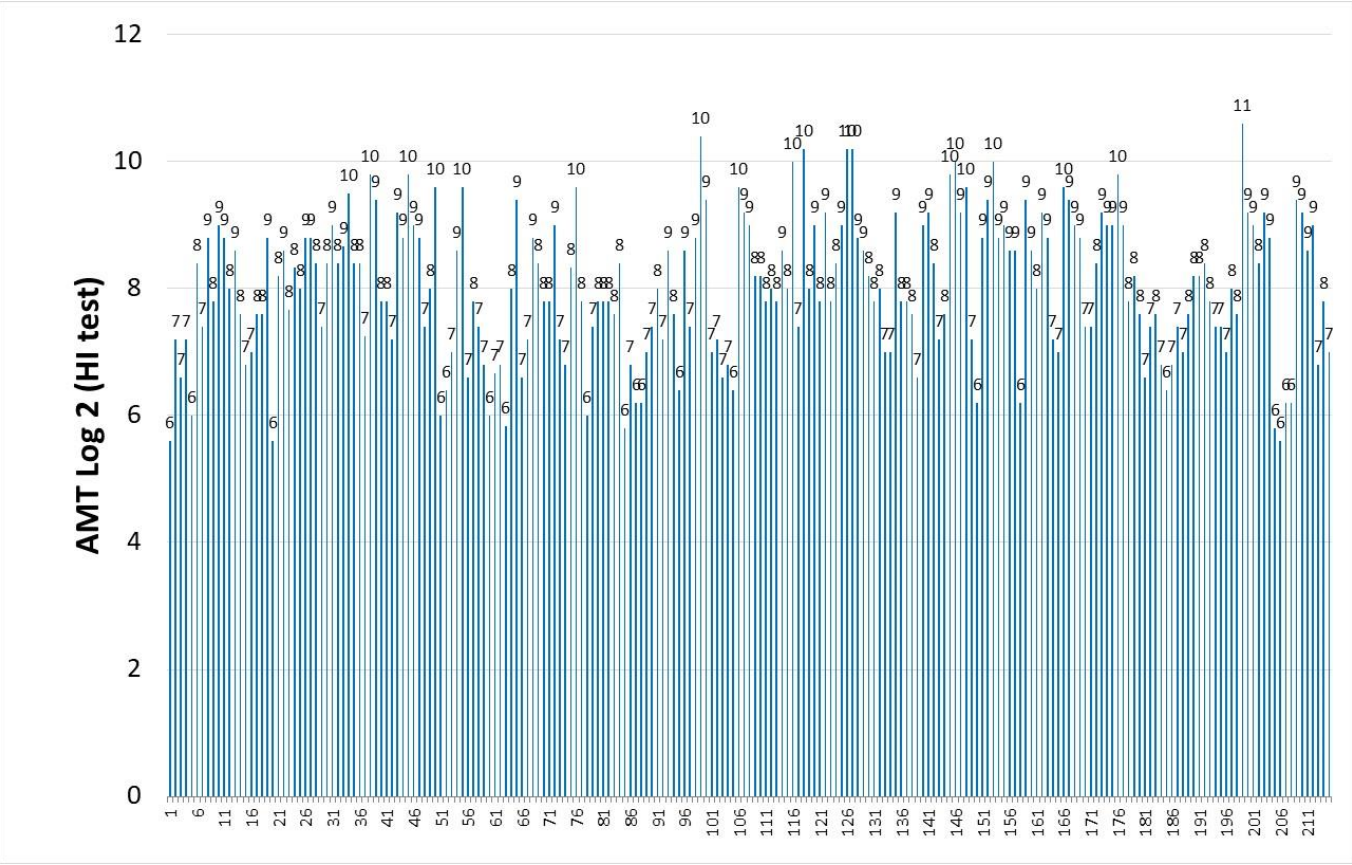
- Conventional broiler-type chicks (Ross 308) were subcutaneously vaccinated at day one with Vectormune® ND vaccine.
- The elicited humoral immunity was assessed using HI test, and using in-house specific IgG-, IgM-, and IgA-ELISA tests at 2, 4, and 6 weeks of age.
- NDV challenges using a Malaysian genotype VII NDV strain.

Table 1: protection rate (%) against velogenic genotype VII NDV challenge according to MDA status and vaccine dose (full, or reduced)

		W3	W4
MDA+	Full dose	53	100
	Reduced dose	28	60
MDA-	Full dose	68	100
	Reduced dose	58	100

RAUW F. et al., 2015. Evaluation of the impact of Newcastle disease specific maternally-derived antibodies and the vaccine dose on immunity induced by rHVT-F(ND) vaccine in day-old broiler chickens. XIXth World Veterinary Poultry Association (WVPA) Congress, Cape Town, South Africa, September 7-11

Maternally derived antibodies against NDV



Maternal derived antibody against NDV:

- Blood samples collected from more than 200 broiler flocks in Indonesia between Oct 2017 - April 2018
- The average AMT was 8 Log_2

- Conventional live and inactivated ND vaccines will definitely face interference with the MDA^{NDV} in these broiler flocks

Natsir, 2019.

Materials and methods

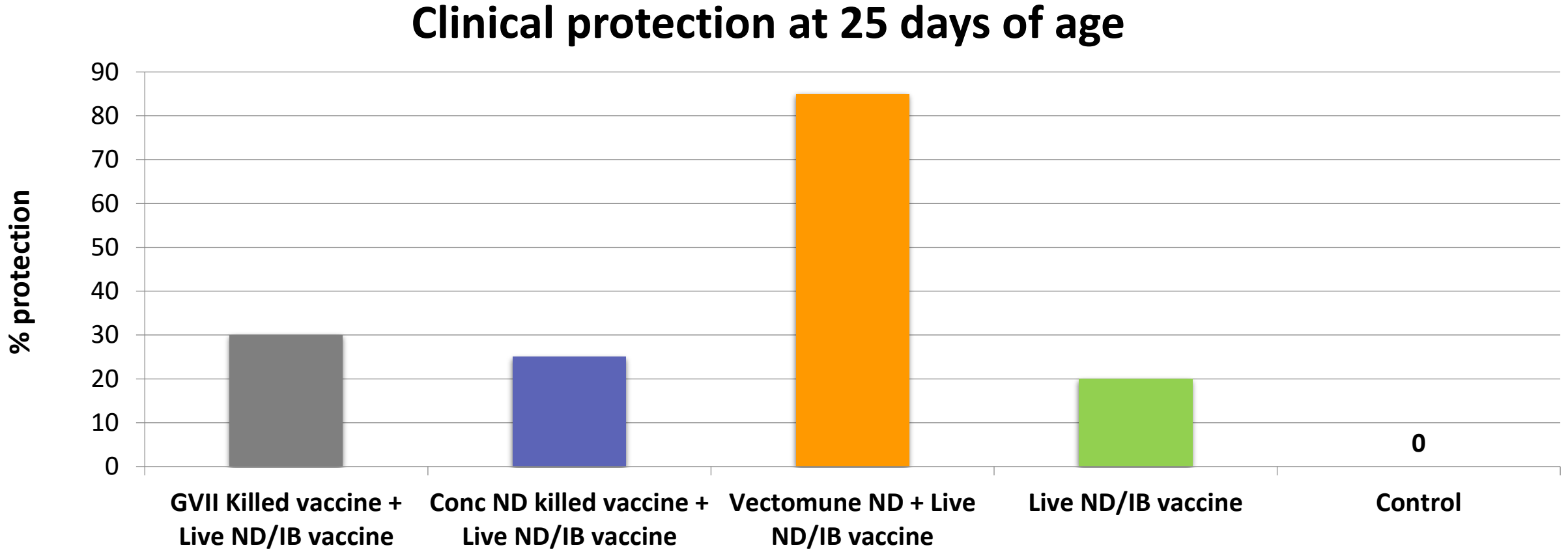
Commercial broilers with MDA^{NDV} of 7.4 log_2 mean HI titre.

Group	Vaccines	Route	Age
1	**Genotype VII killed ND** vaccine Live ND/IB vaccine	SQ Spray	Day-old
2	**Concentrated killed ND** vaccine Live ND/IB vaccine	SQ Spray	Day-old
3	**Vectormune ND** Live ND/IB vaccine	SQ Spray	Day-old
4	Live ND/IB vaccine	Spray	Day-old
5	no	-	-

Challenge virus: NDV recent isolate from **Indonesia** (D1675/11/ID); genotype VIIi; 5.0 $lgELD_{50}$/chick by intranasal route at **25 days** of age.

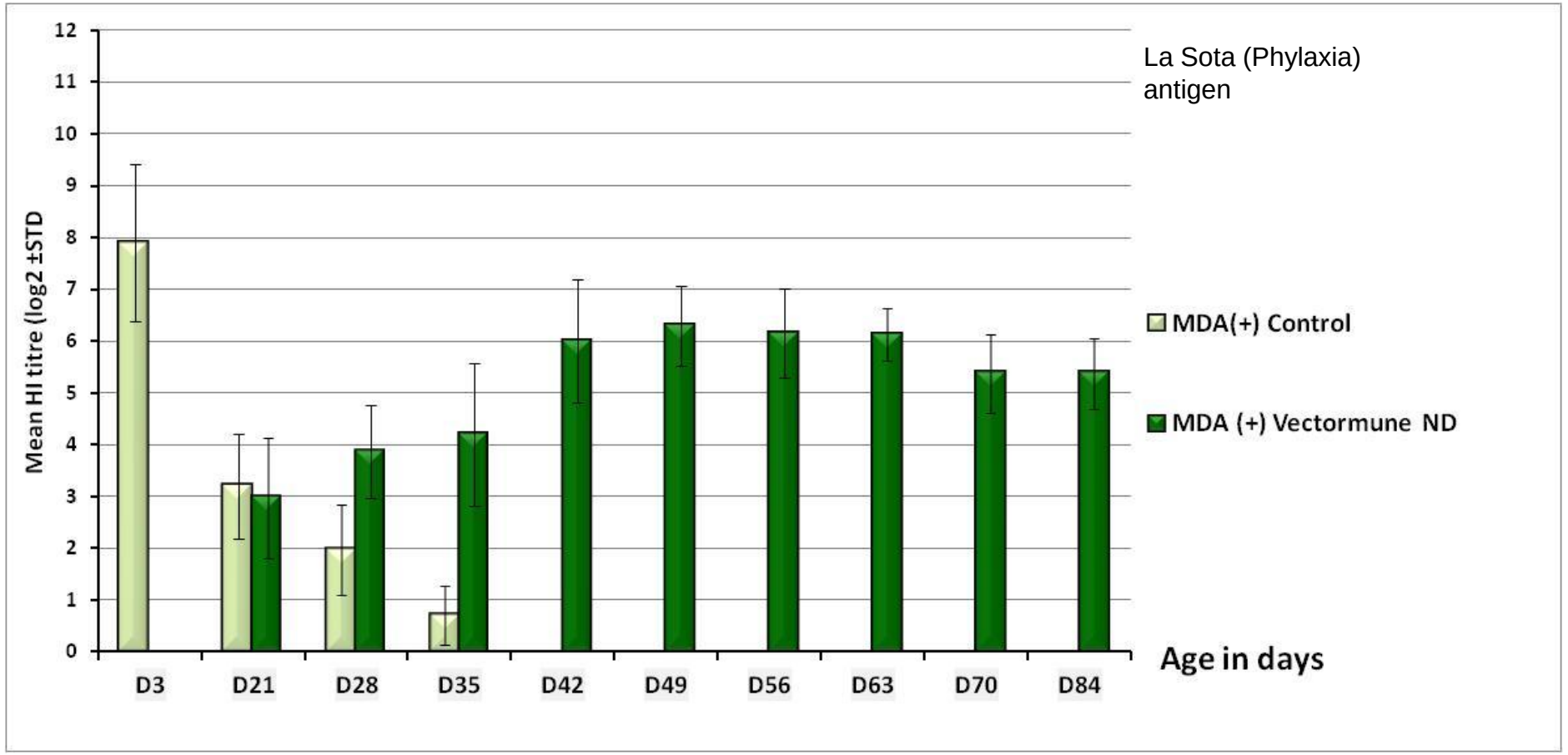
Source: Ceva Animal Health internal study – unpublished reference: SIS # 16/2012/P/SSIU, Ceva-Phylaxia, Budapest-Hungary, 2013

Results



Source: Ceva Animal Health internal study – unpublished reference: SIS # 16/2012/P/SSIU, Ceva-Phylaxia, Budapest-Hungary, 2013

ND HI Antibody Titres of commercial pullets vaccinated SQ at day-old with Vectormune® ND vaccine



Gardin Y., 2016, AAAP.

Broad protection of Vectormune ND®

Trial	Genotypes	Strain	Type of bird	Challenge			Protection rate (%)	
				Age (weeks)	Dose (log_{10} ELD_{50} /bird)	Route	Vaccinated	Controls
1	II	Texas GB strain	SPF chickens	4	4.0	Intramuscular	100	0
2	II	Texas GB strain	Commercial layers	19	4.0	Intramuscular	100	0
3	II	HB1 vaccine strain	Commercial broilers	1/2/3/4/5	3.5	Ocular	0/10/60/90/100	0/0/0/0/0
4	II	HB1 vaccine strain	Commercial turkeys	1/2/3/4/5	3.5	Intra-nasal	100/67/33/80/100	44/0/0/0/0
5	IV	Herts 33/56	SPF chickens	4	5.0	Intra-nasal	100	0
6	IV	Herts 33/56	Commercial broilers	3	5.0	Intramuscular	95	0
7	IV	JEL strain	SPF chickens	6	5.0	Ocular	100	0
8	V	APMV1/chicken/Mexico/0516/1/2008	SPF chickens	4	5.0	Intra-nasal	100	0
9	V	APMV1/chicken/Mexico/0516/1/2008	Commercial broilers	3/4/6	5.0	Oculo-nasal	81/95/100	0/0/0
10	V	Chimalhuacan strain	Commercial broilers	2/3/4/5	5.0	Oculo-nasal	0/84/100/100	0/0/0/0
11	V	Chimalhuacan strain	Commercial layers	5	5.0	Oculo-nasal	70	0
12	VII	Lopburi	Commercial layers	2/3/4	5.0	Intramuscular	90/100/100	90/70/10
13	VIIa	D1598/1/11/PH	SPF chickens	4	5.0	Intra-nasal	100	0
14	VIIa	D1675/6/05/PE	Commercial layers	3/5/8/10	5.0	Intra-nasal	48/90/100/100	0/0/0
15	VIIb	D575/6/05/PE	SPF chickens	4	5.0	Intra-nasal	100	0
16	VIId	D1435/3/3/SA/10	SPF chickens	4	5.0	Intra-nasal	100	0
17	VIId	D1500/2/1/10/CN	SPF chickens	4	5.0	Intra-nasal	100	0
18	VIId	GPMV171/06/ZA (Goose Paramyxovirus)	Commercial broilers	3/4/5	5.0	Choanal route	100/100/100	0/0/0
19	VIId	GPMV171/06/ZA (Goose Paramyxovirus)	Commercial layers	72	5.0	Intra-nasal	100	0
20	VIIh	D1524/1,2/MY/10	SPF chickens	2/3/4/6/8	5.0	Intra-nasal	95/90/100/100/100	0/0/0/0
21	VIIh	D1524/1,2/MY/10	Commercial broilers	2/3/4/6	5.0	Intra-nasal	25/68/95/100	5/0/0/0
22	VIIh	D1524/1,2/MY/10	Commercial layers	2/3/4/63/4/6/ 10/15/25/34/ 40/55/72	5.0	Intra-nasal	74/95/100/ 100/100/100/100/ 100/100/100	20/0/0/0/0 /0/0/0/0/0
23	VIII	RB Daagstan ND/01/2A	SPF chickens	4	5.0	Intra-nasal	100	0

PANIAGO M. et al., 2016. Assessment of the protection induced by a vector rHVT-F vaccine against di erent genotypes of Newcastle disease virus. *65th Western Poultry Disease Conference (WPDC), Vancouver, BC, Canada, April 24-27*

vaccines

MDPI

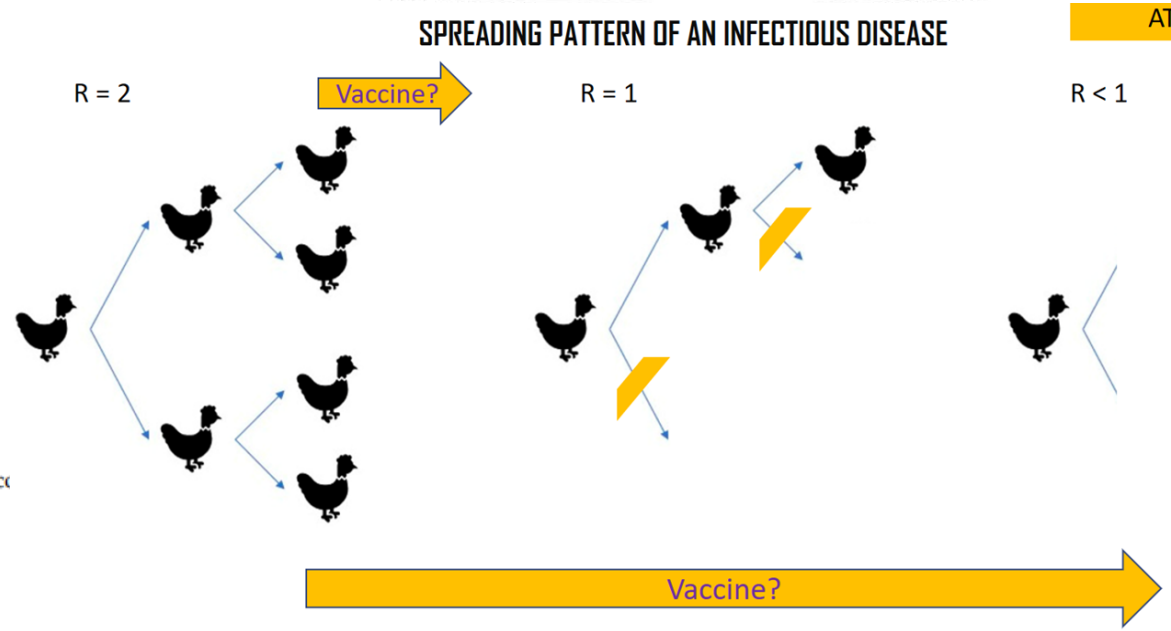
Article

A Herpesvirus of Turkey-Based Vector Vaccine Reduces Transmission of Newcastle Disease Virus in Commercial Broiler Chickens with Maternally Derived Antibodies

Timea Tatár-Kis [1], Egil A.J. Fischer [2], Christophe Cazaban [3], Edit Walkó-Kovács [1], Zalan G. Homonnay [1], Francisca C. Velkers [2], Vilmos Palya [1] and J. Arjan Stegeman [2,*]

Vaccines **2020**, *8*, 614; doi:10.3390/vaccines8040614 www.mdpi.c

AT FLOCK LEVEL!

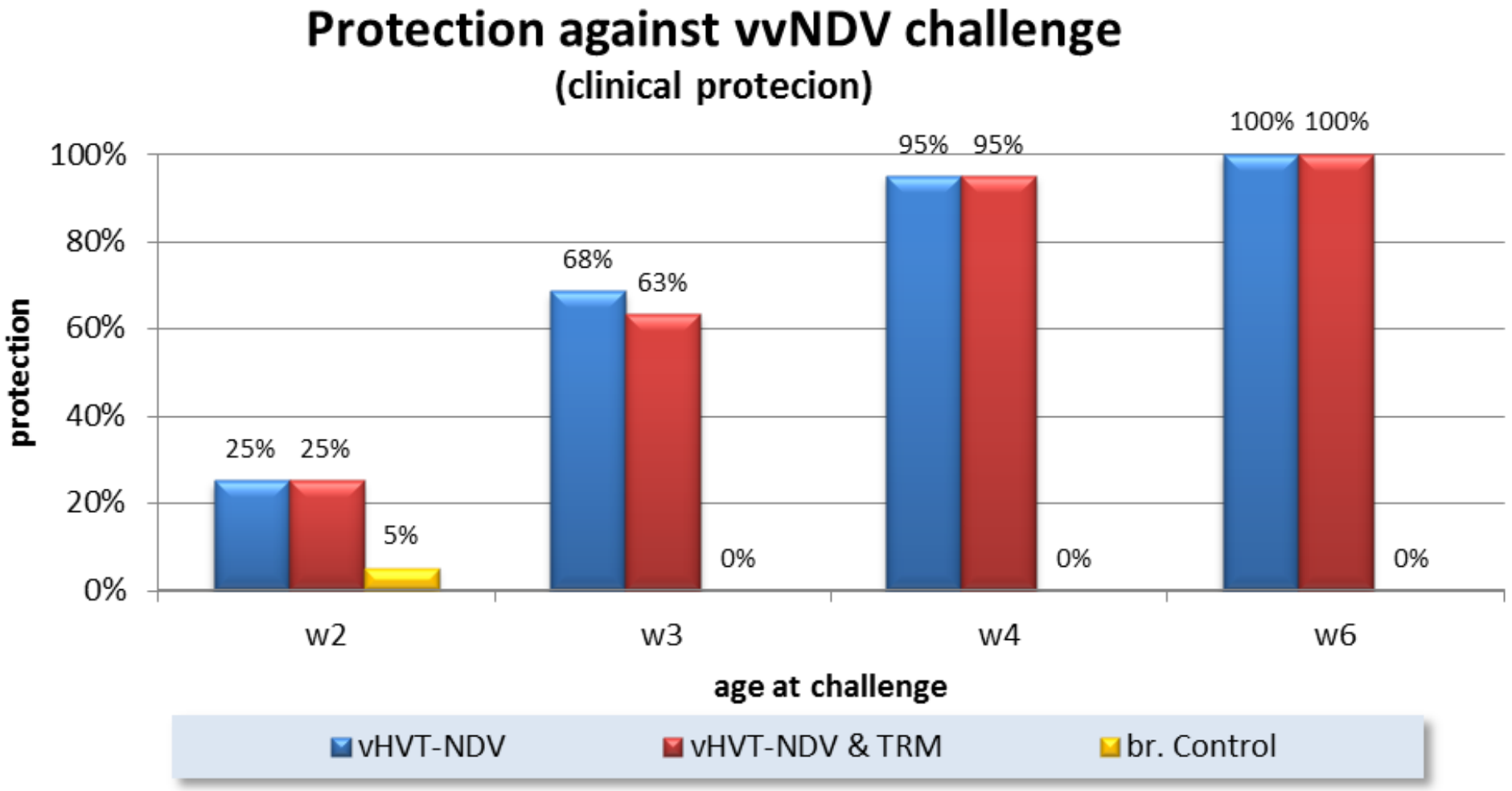


- Vaccinated birds were completely protected against clinical disease and virus excretion was significantly reduced compared to the unvaccinated controls that all died during the experiment.
- The reproduction ratio, was significantly lower in the vaccinated group (0.82 (95% CI 0.38–1.75)) than in the unvaccinated group (3.2 (95% CI 2.06–4.96)).

R – reproduction ratio was significantly lower!

Demonstrates the potential of Vectormune ND in the prevention and control of ND outbreaks!!!

Compatibility study Vectormune ND® & Transmune®



Compatibility of Vectormune® HVT NDV vaccine with Cevac Transmune IBD in day-old commercial broilers, Internal Study No.: SCI-137-2011

Compatibility study Vectormune ND® & Transmune®

- Similar ND protection rates were achieved, in case of mixed vaccination (this study) compared to single vaccination previous experiments (Challenge strain: Herts 33/56, dose: 5log10 ELD50/bird)
- The presence of bursal lesions was similar compared to the average bursal lesions when Cevac® Transmune® had been administered alone

Results

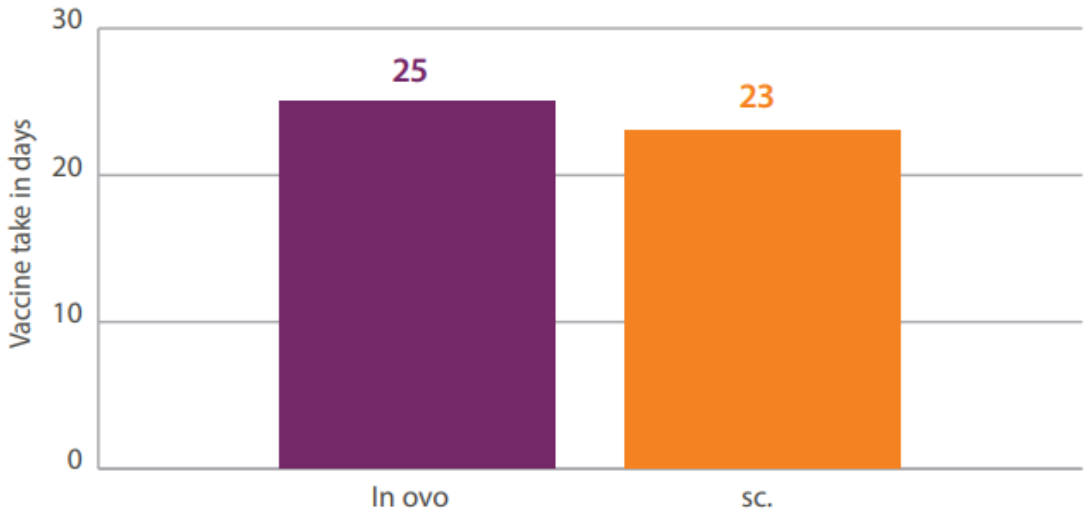


Fig. 1: Cevac® Transmune® vaccine take (in days).

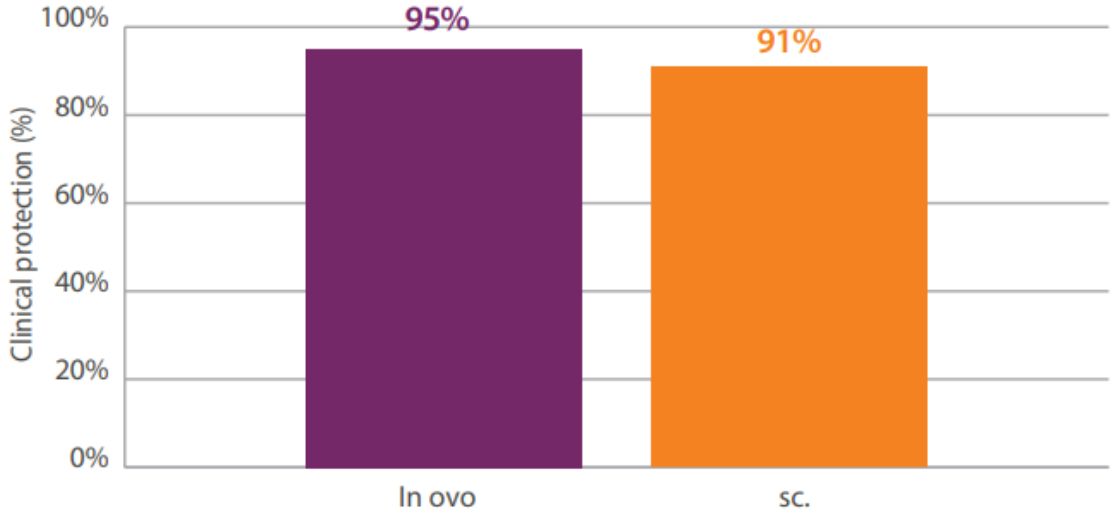


Fig. 2: Clinical protection against NDV challenge at 32 days of age (%).

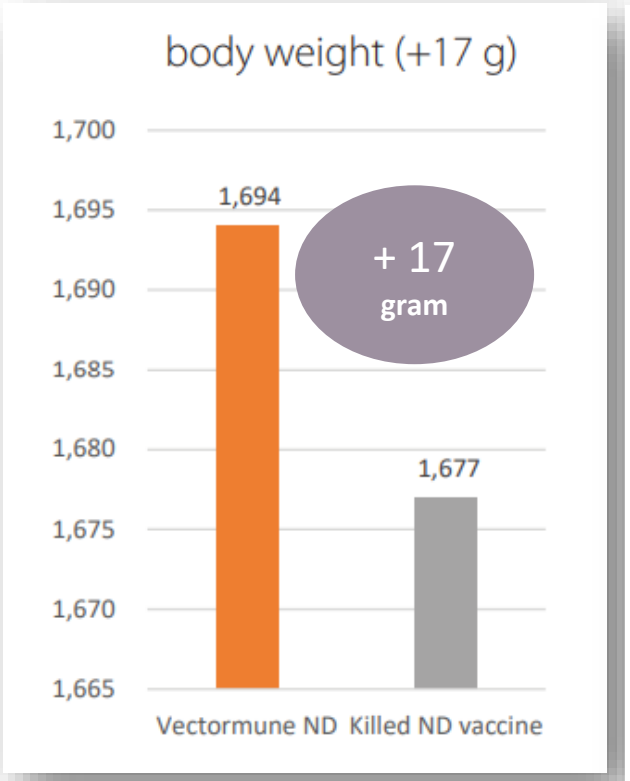
GYURO, Z., et al., 2018. Combining Vectormune® ND and Cevac® Transmune® IBD in one injection provides early protection in broilers against ND and IBD. 12th International Symposium on Marek´s Disease and Avian Herpes viruses, July 29th, August 2nd, Yangzhou, China

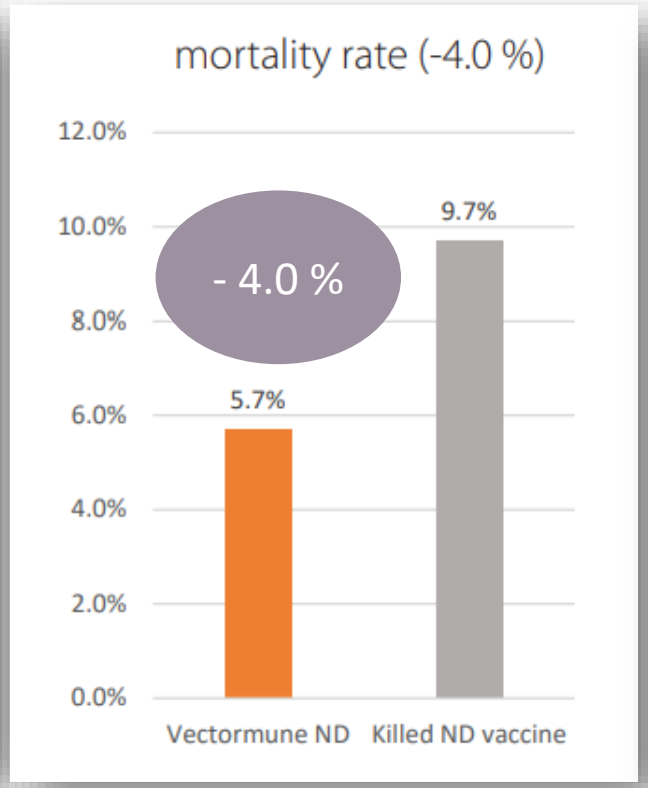
Vectormune ND in Indonesia

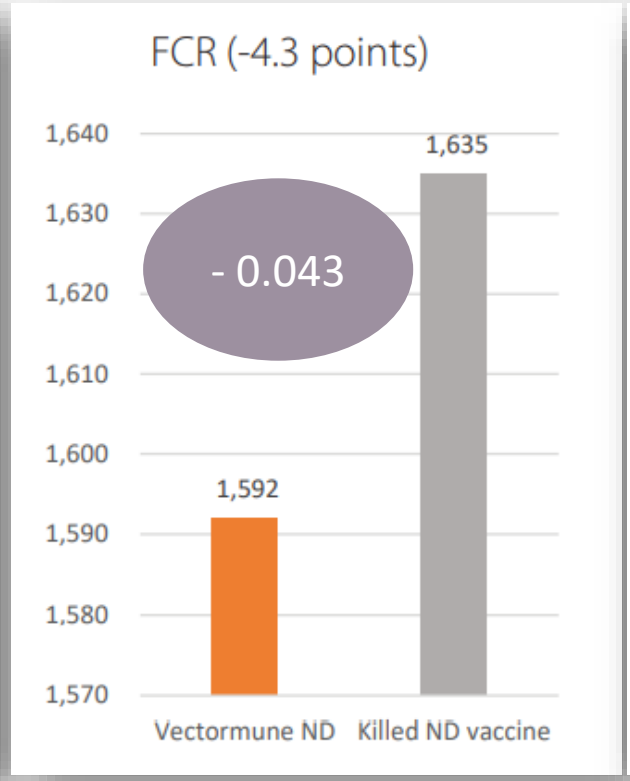
- Periode monitoring: September 2019 – Mei 2020
- 256 broiler komersial flok dari 10 perusahaan
- Parameter yang di monitor
  - Performa (BW, FCR, % Kematian)
  - Sampel titer ND pada saat masa panen
- Program vaksinasi:

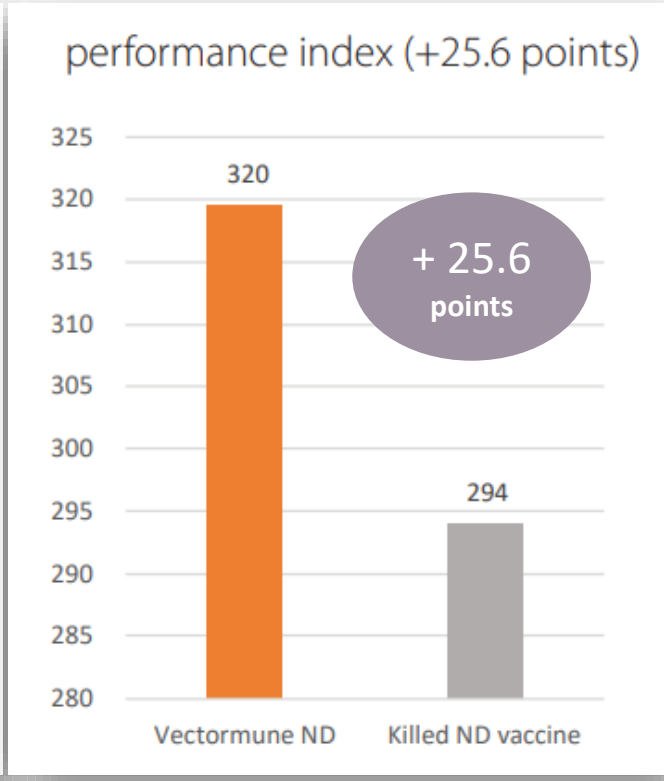
	ND killed grup: **15.1 juta ekor**	**Vectormune ND grup:** **12.6 juta ekor**	**Rute**
Hatchery	Cevac Broiler NDK Transmune Vitabron/Cevac NBL	Vectormune ND Transmune Vitabron/Cevac NBL	SC SC Spray
Farm	ND Live 12 – 16 hari	ND Live 12 – 16 hari	Spray atau Air minum

Economic Value







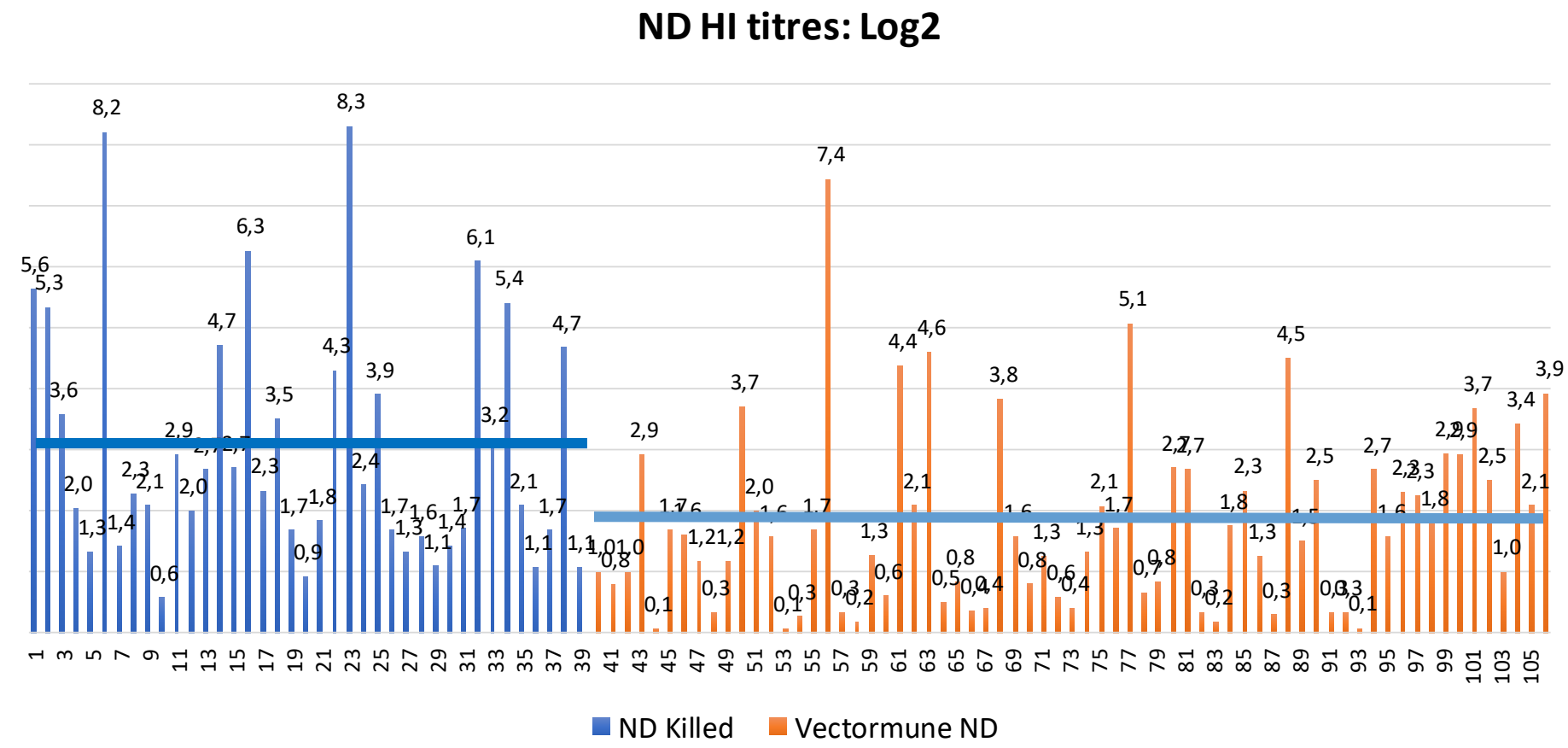


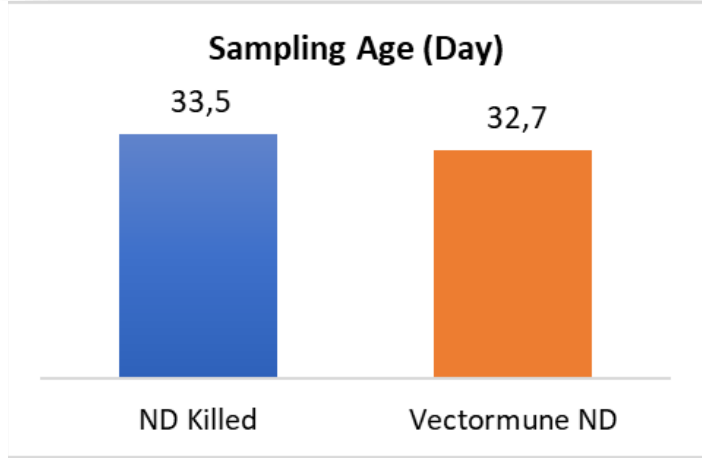


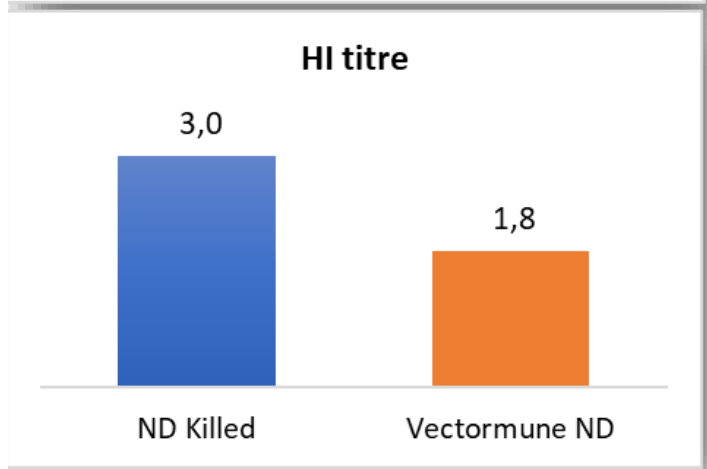
Extra Rp 741,650 per 1,000 ekor

*feed price 7,000 IDR/kg, live bird 18,000 IDR/kg

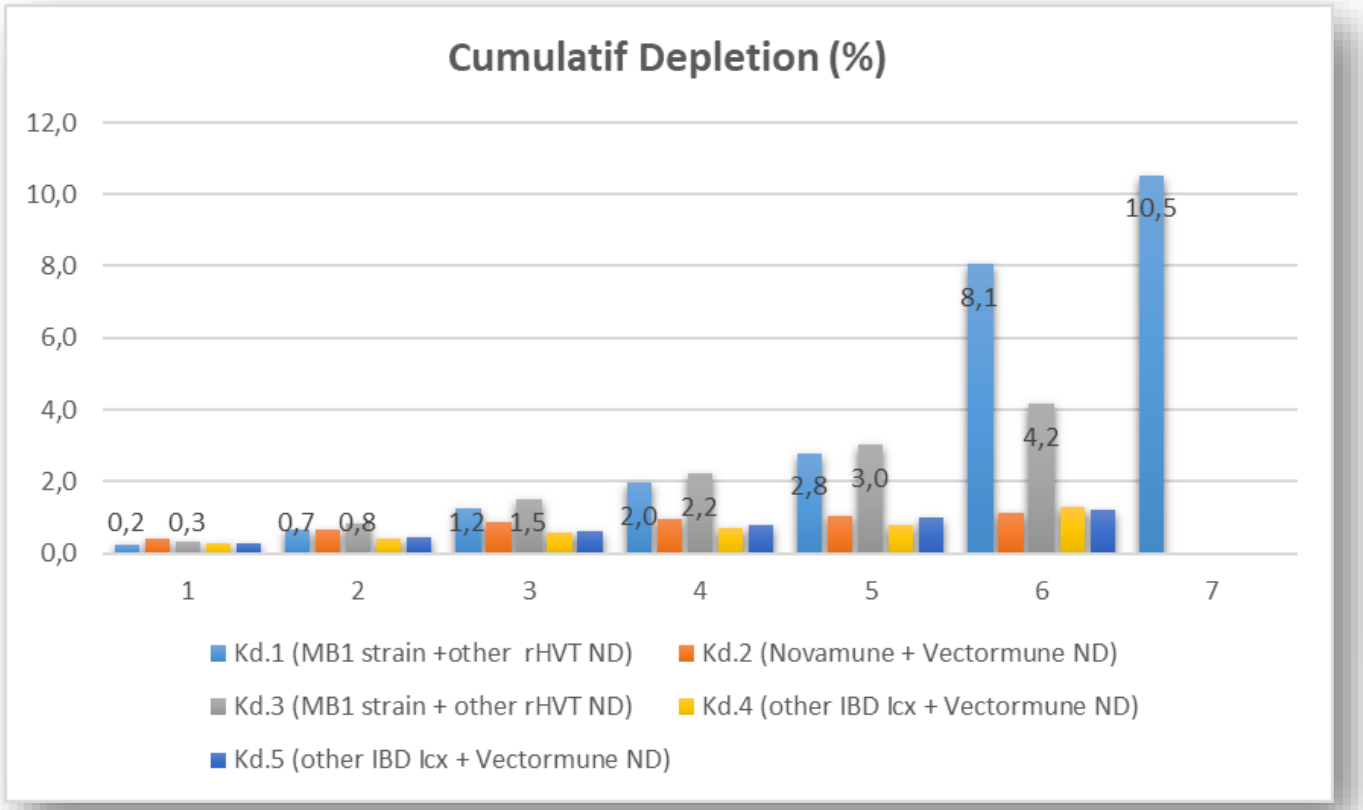
ND titre: Before and after

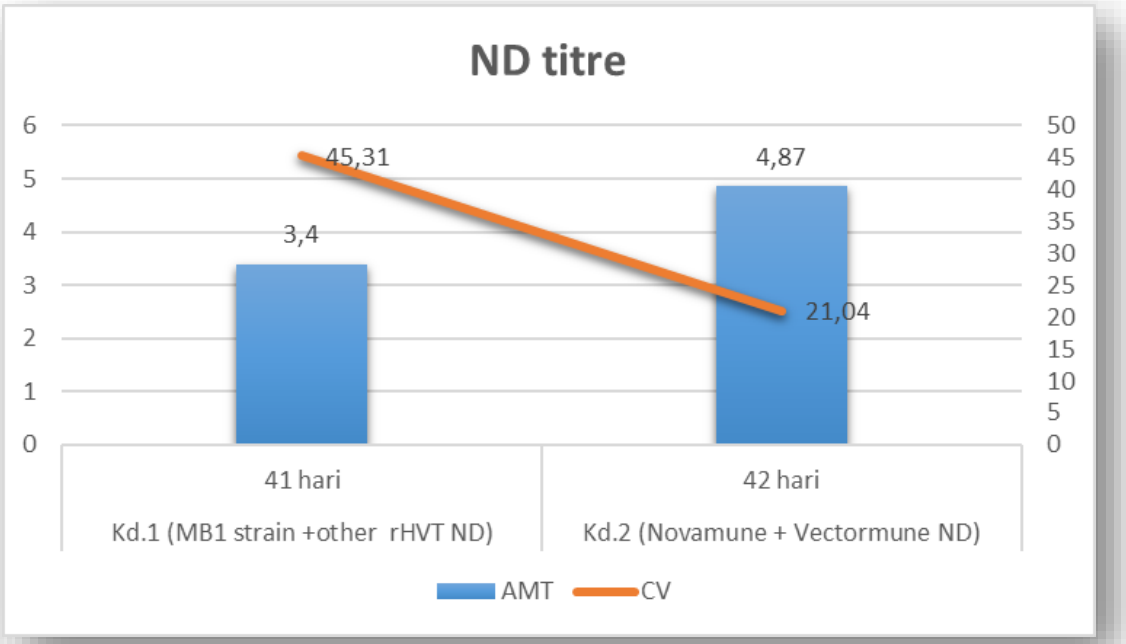






Demonstrate ND protection of Vectormune ND ® Rispen and Novamune® versus other combination





- A Layer commercial farm located in high ND challenge
- Monitoring done in the same period (April – May 2021)
- HI test done in the same lab

TRANSMUNE IBD

STOP
THE GUMBORO CYCLE

of peace of **mind**
stops the Gumboro cycle

of **consistency**
flocks with uniform results

of **trust**
strong partnership between producers & Ceva year after year



TRANSMUNE IBD

Vectormune ND

3 DIFFERENTIATIONS

1) BETTER ONSET OF IMMUNITY FOR ND

2) LOWER SHEDDING OF ND

3) STOP THE GUMBORO CYCLE



ceva