ELISA Titers in Georgia Poultry Flocks

2023-2024

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Every year, GPLN aggregates biennial ELISA titers by poultry production type and age ranges covering the data from the previous 2 years. This report summarizes the **2023 and 2024 data.**

General Comments:

- This report only includes flocks from Georgia complexes.
- The poultry industry monitors flocks for the presence/absence of disease and for vaccination monitoring. Included in this report are monitored flocks only. No diagnostic case data is included.
- All flock results are verified. They have valid kit and internal reference control (IRC) values. The IRC is a field sample with an expected titer range that is diluted just like the field samples in the test, as opposed to the kit controls that are pre-diluted.
- Kit used: IDEXX.
- All data is in the graphs, regardless of the number of flocks represented. The number of flocks represented for each data point is between parentheses next to the age range on the x-axis. Please note that a few data points represent only 1 or 2 flocks.

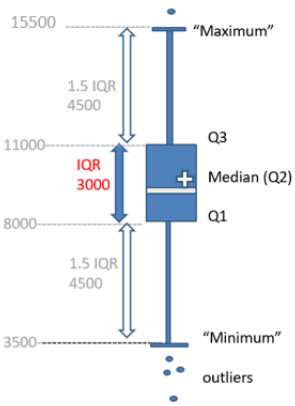
BAR GRAPHS:

- Each bar represents the average GMT of all flocks in the database for that bird type and age range.
- The CV's found under the x-axis are the average of all coefficients of variation for all flocks in the database for the corresponding bird type and age range.
- The positive cutoff for an individual bird sample (397 for most kits) is represented on the graph as a horizontal line (for reference).
- The last 5 graphs on this report show yearly trends (one year, not two) for IBV, REO, AE and IBD for critical age ranges in breeders and broilers.

BOX PLOTS:

- The box plots display the data in a manner that gives a better understanding of the variability of the average flock titers within a population of flocks. A detailed explanation is below.

Tukey Box and Whisker plot explained



- The median (line in the box) is the middle value of the dataset.
- The cross is the mean.
- The box contains 50% of the values.
- The IQR (inter quantile range) is the difference between the values on top and bottom of the box.
- The minimum and maximum (whiskers) are calculated at 1.5X the IQR
- Any values higher or lower than the min and max (whiskers) are the outliers.
- If the distribution is normal (it often is not), the outliers are <1% (0.70%) of the data.

ELISA Titers in GA Poultry Flocks

Uses:

- Flock managers can utilize this data by comparing their own serological results against Georgia data for flocks falling within the same age ranges. They can also compare their own company baselines to GPLN's.
- Students can use this report to compare what is theoretically expected of flock responses to vaccination and field exposure versus what is observed from Georgia flocks.
- The GA baselines should not be expected to reflect titers found in other areas of the US, other countries, or those obtained from different kit manufacturers.

ENJOY!
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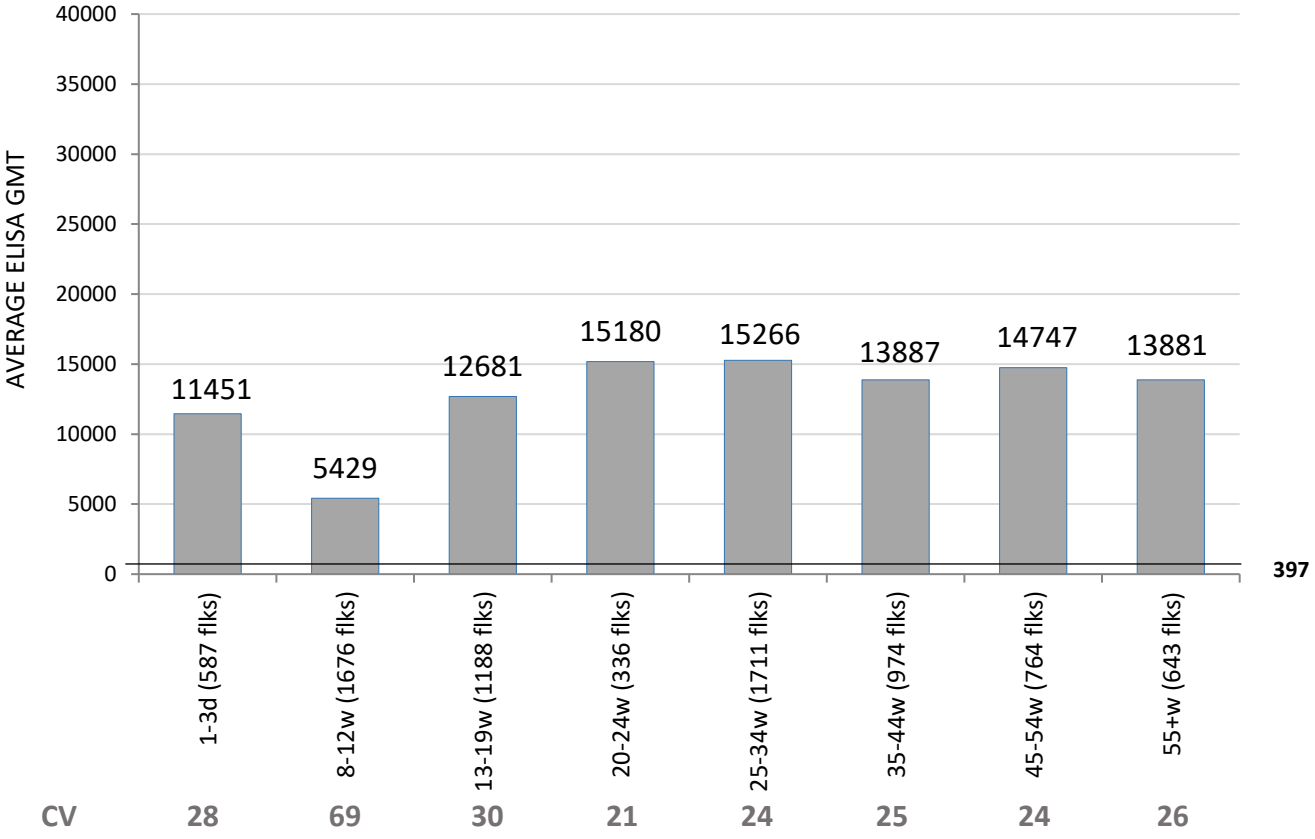
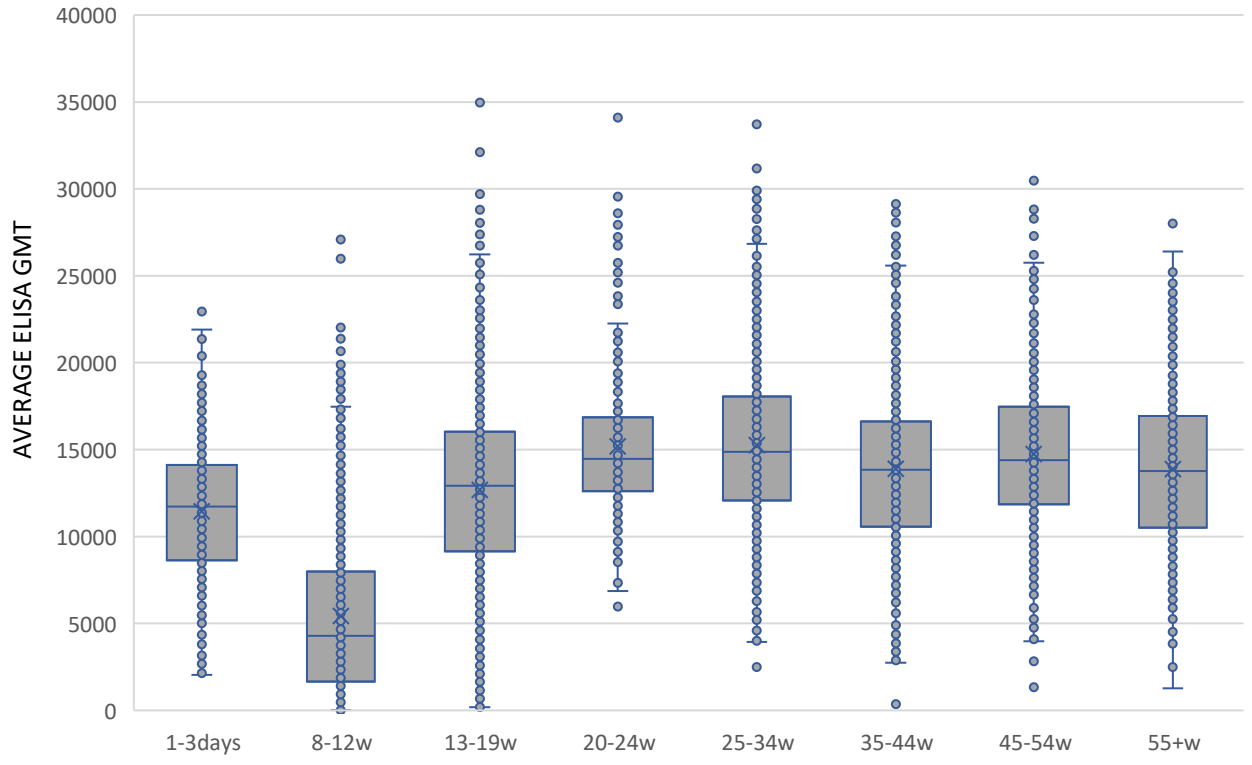
ELISA Titers in Broiler Breeders

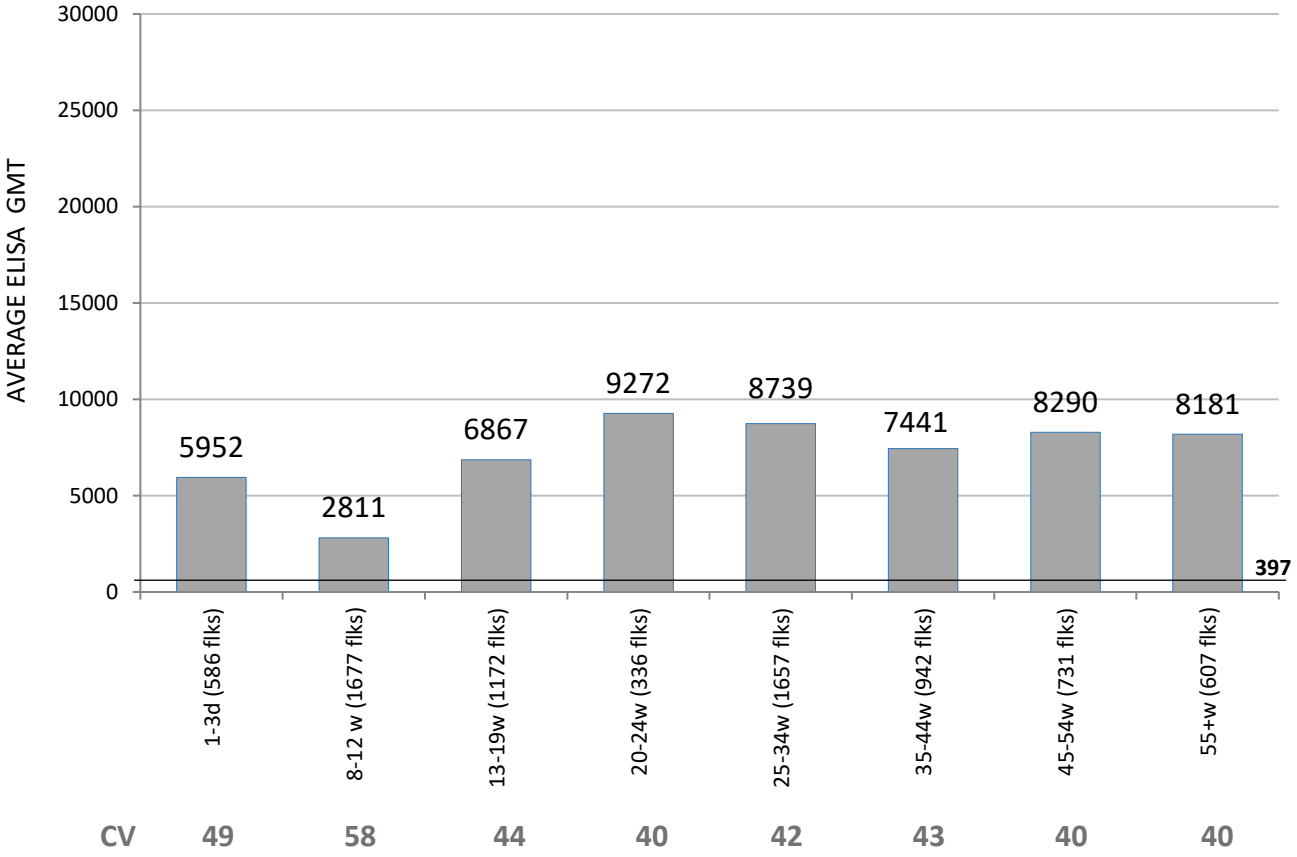
1. Age ranges are the same as for previous reports. They fit the functional ages in the life of a breeder and fit the timing of the vaccination responses as explained below.
    - *1d represents the level of maternal antibodies in day old pullets and cockerels coming from the grandparent flocks.*
    - *GPLN receives very few, if any, samples from young pullet flocks between 1 day and 8 weeks of age. During that period of time, the following would be expected: at 2-4 weeks of age, titers would be very low due to the decline of maternal antibodies. After 4 weeks of age, titers would be steadily increasing due to live vaccinations and field exposure.*
    - *8-12w represents the response to natural exposure in pullets, as well as the response to vaccinations with live primers.*
    - *13-19w represents the response to natural exposure in pullets, as well as the response to vaccinations with live primers and to the first inactivated vaccination, given at or around 12 weeks of age.*
    - *20-24w represents the response to natural exposure in pullets, as well as the response to vaccinations with live primers and to the first inactivated vaccination, given at or around 12 weeks of age plus the response to the second inactivated vaccination given at or around 18 weeks of age.*
    - *The rest of the life of breeder flocks is divided in 10-week increments.*
2. All complexes represented in this report are vaccinating their pullets twice with inactivated vaccines.
3. The breeder NDV and IBV data is split between 3 vaccination strategies:
    - complexes that vaccinate pullets only with live vaccines (L-PO for LIVE-PULLETS ONLY),
    - complexes that use live vaccines followed by inactivated vaccines in pullets (L-K for LIVE and KILLED vaccines in pullets).
    - complexes that vaccinate pullets with live vaccines and continue using live vaccines during production. (L-LP for LIVE Vaccination in PULLETS and LIVE vaccination DURING PRODUCTION)
4. The CAV data is presented in tabular form including the % positive data.
5. The number of samples per flock in this series is 10 or greater.
6. Note that the y-axis range of values are the same on the bar graph and on the box plot found on the same page.

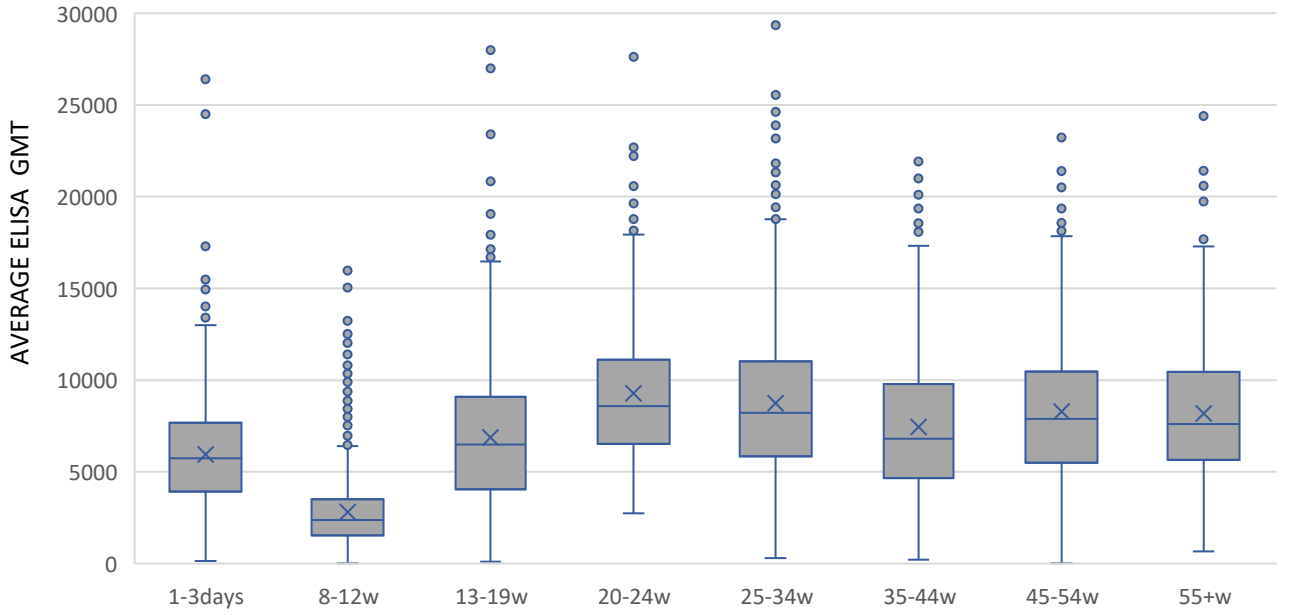
Breeder IBD-XR titers and CVs by age





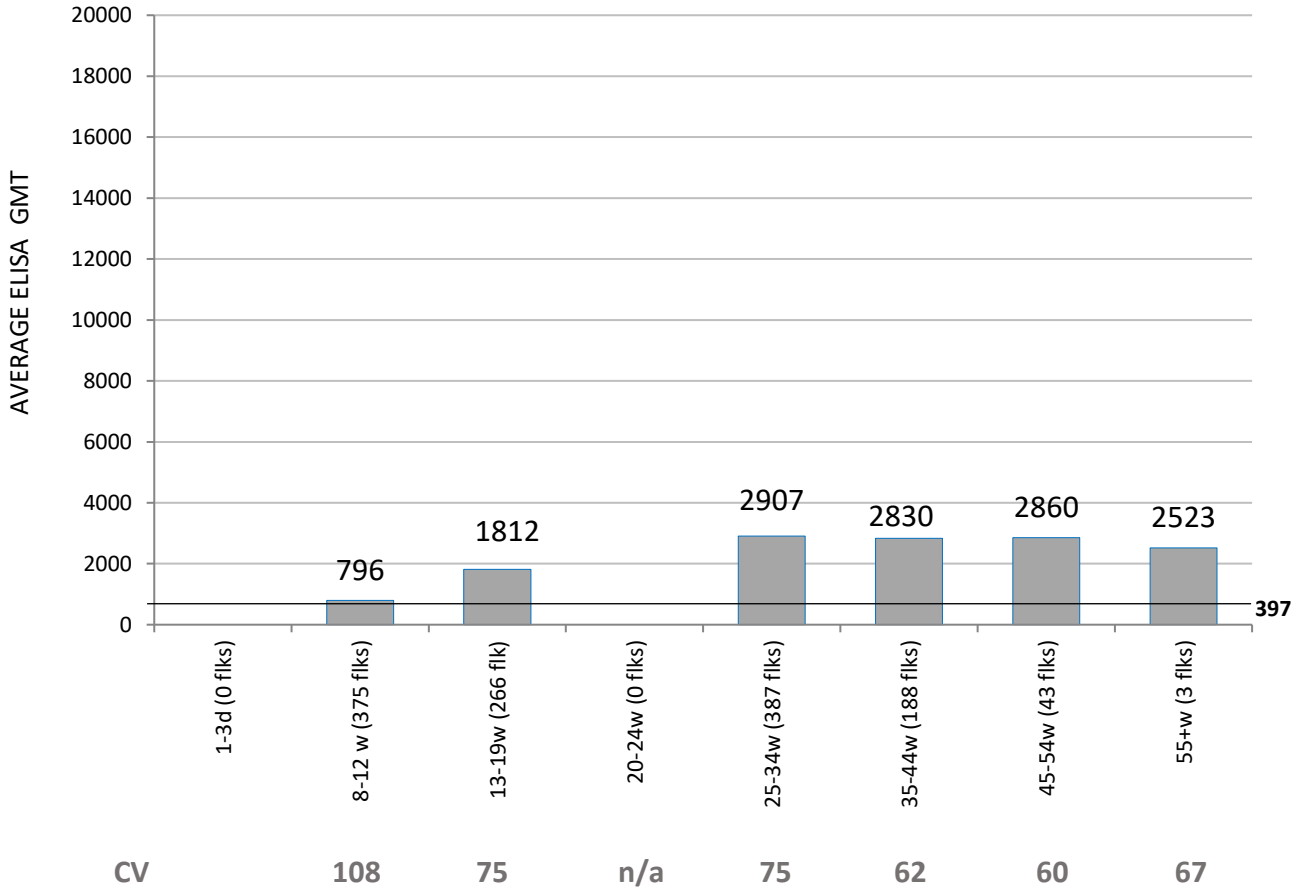
Breeder REO titers and CVs by age

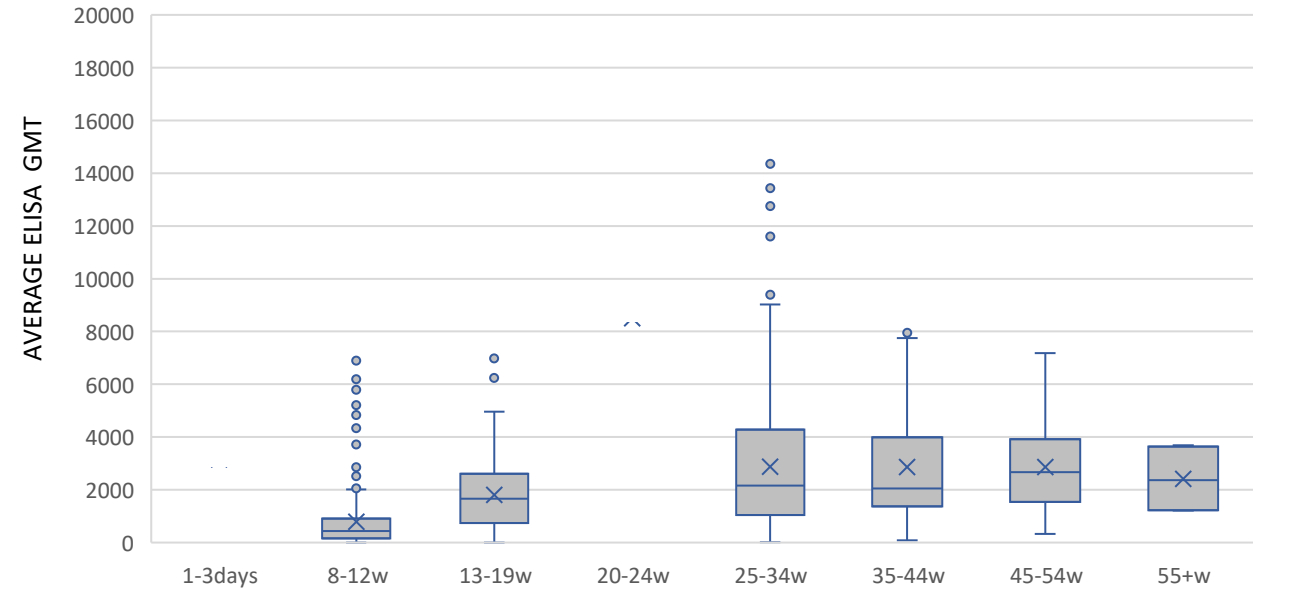




Breeder NDV titers and CVs by age

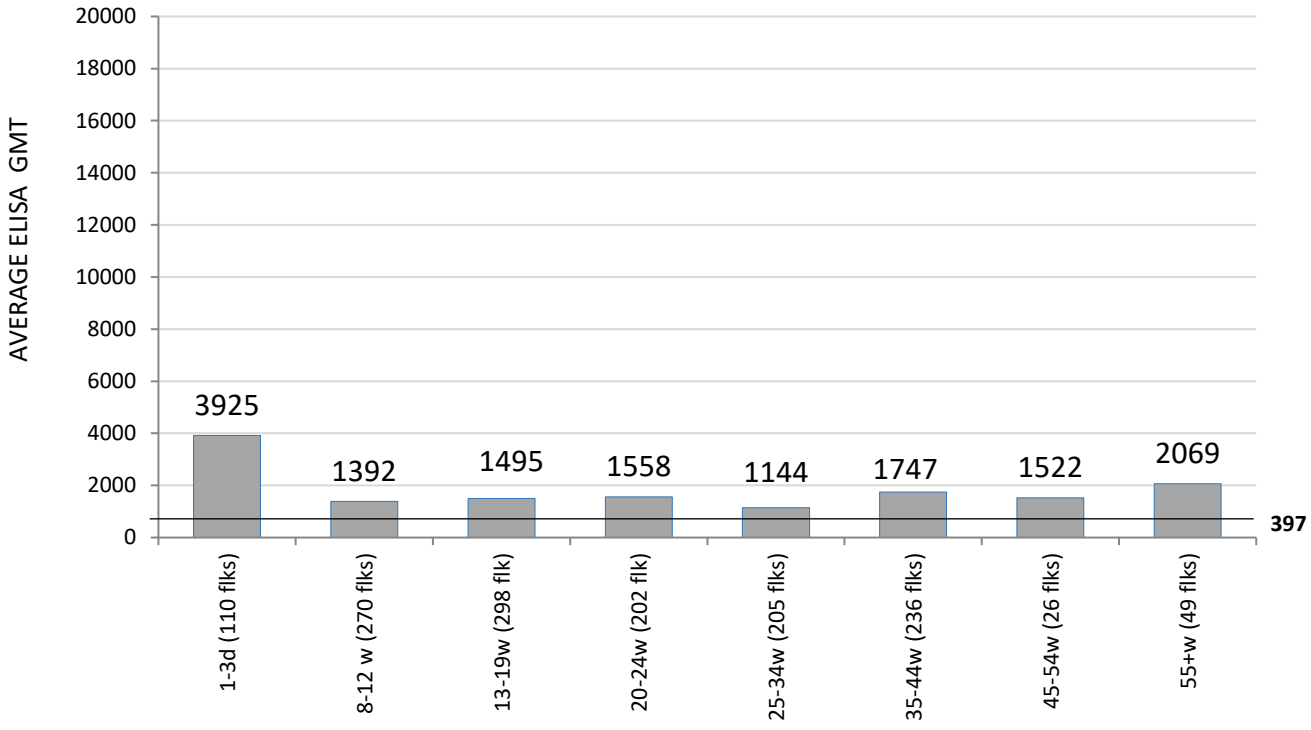
L-PO programs (Live vaccines in pullets only)



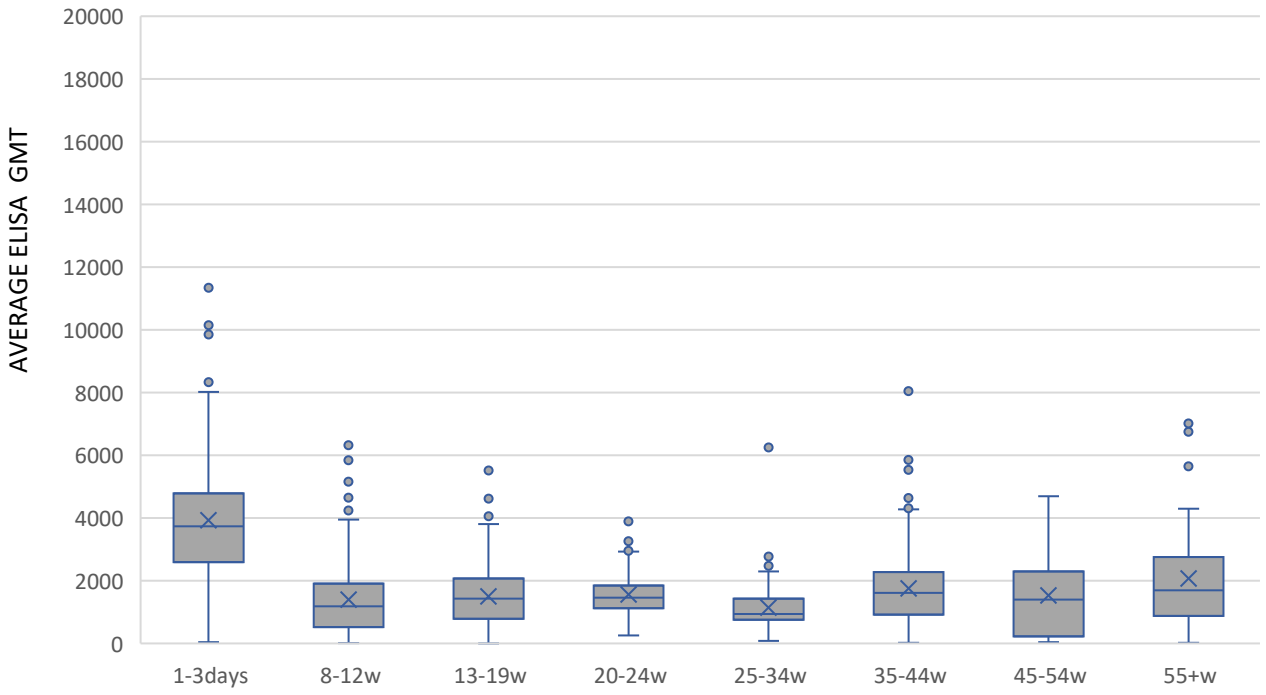


Breeder NDV titers and CVs by age

L-LP programs (Live vaccines in pullets and during production)

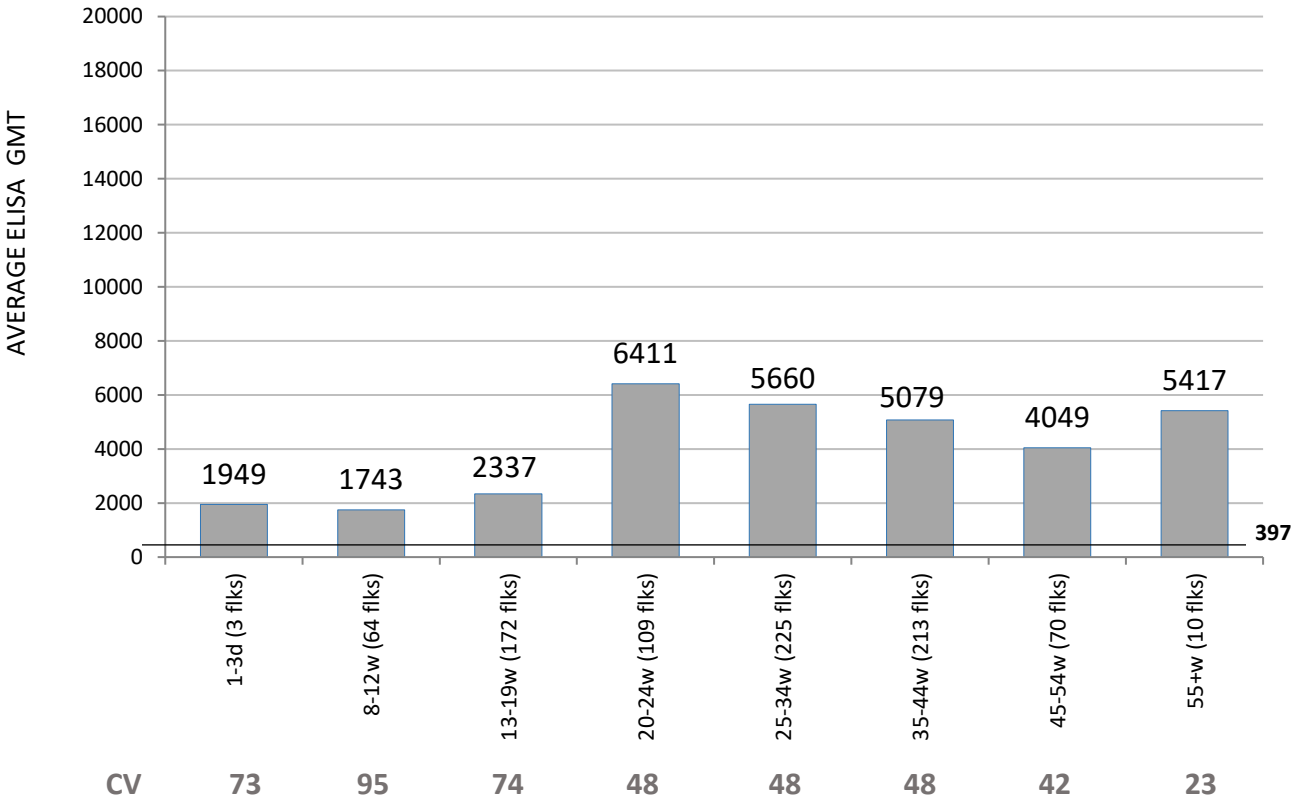


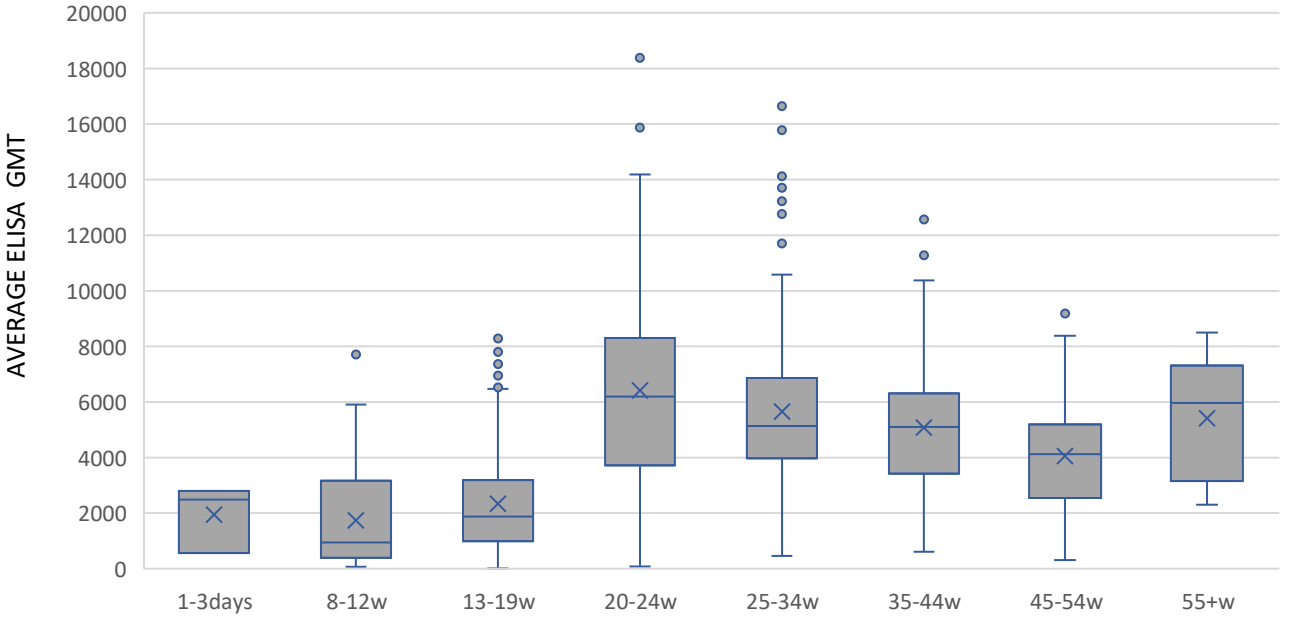
CV	55	87	76	66	81	73	70	67



Breeder NDV titers and CVs by age

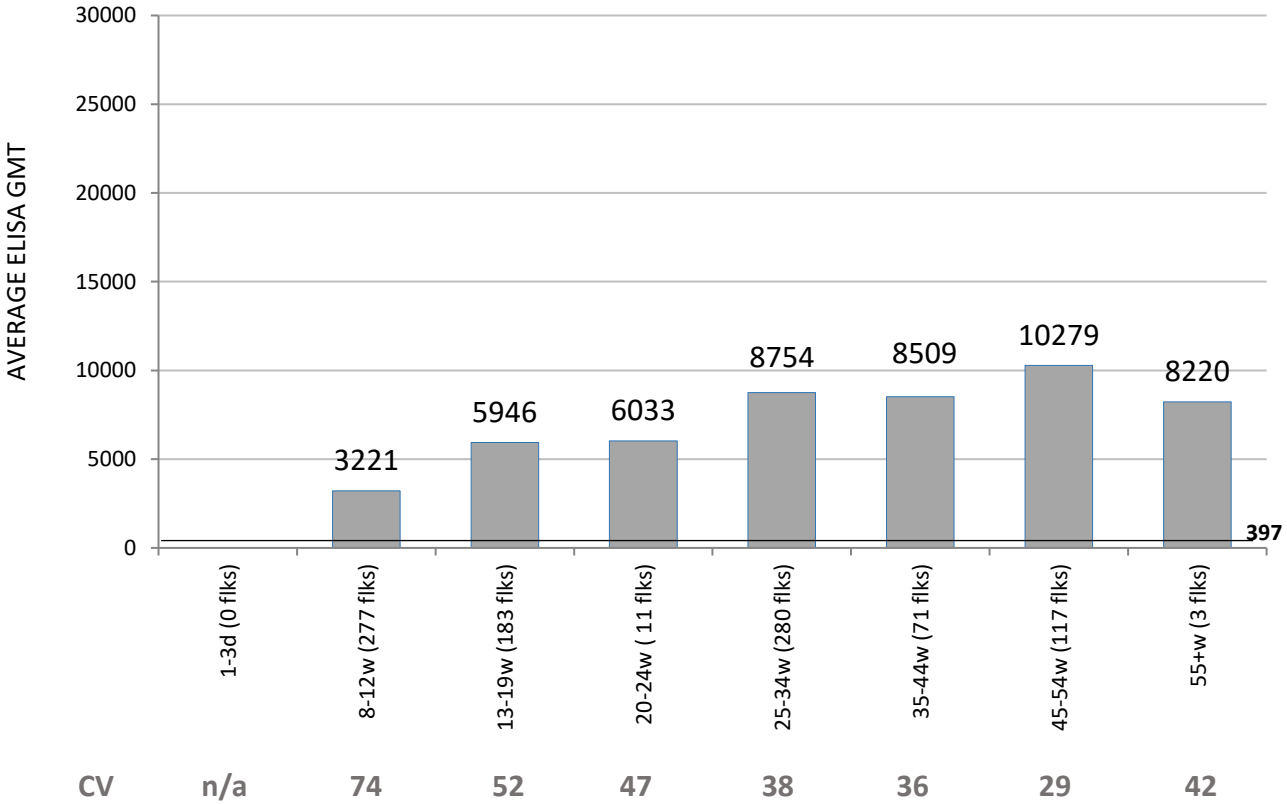
L-K Programs (Live and inactivated vaccines in pullets)



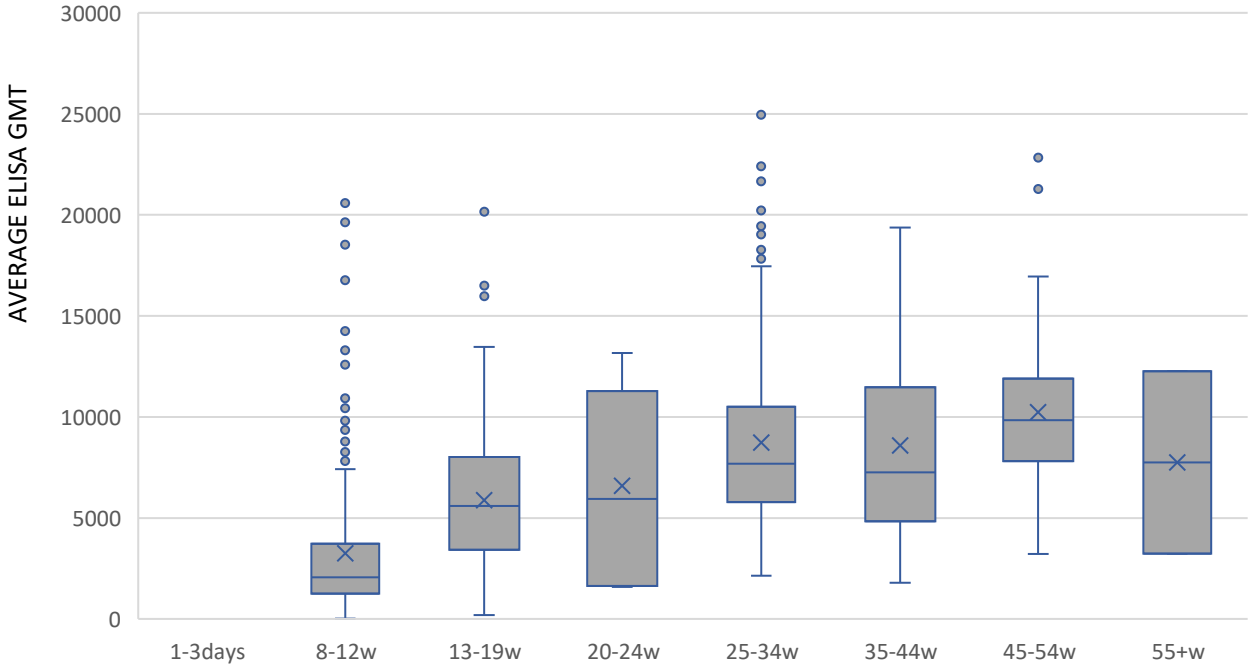


Breeder IBV titers and CVs by age

L-PO programs (Live vaccines in pullets only)

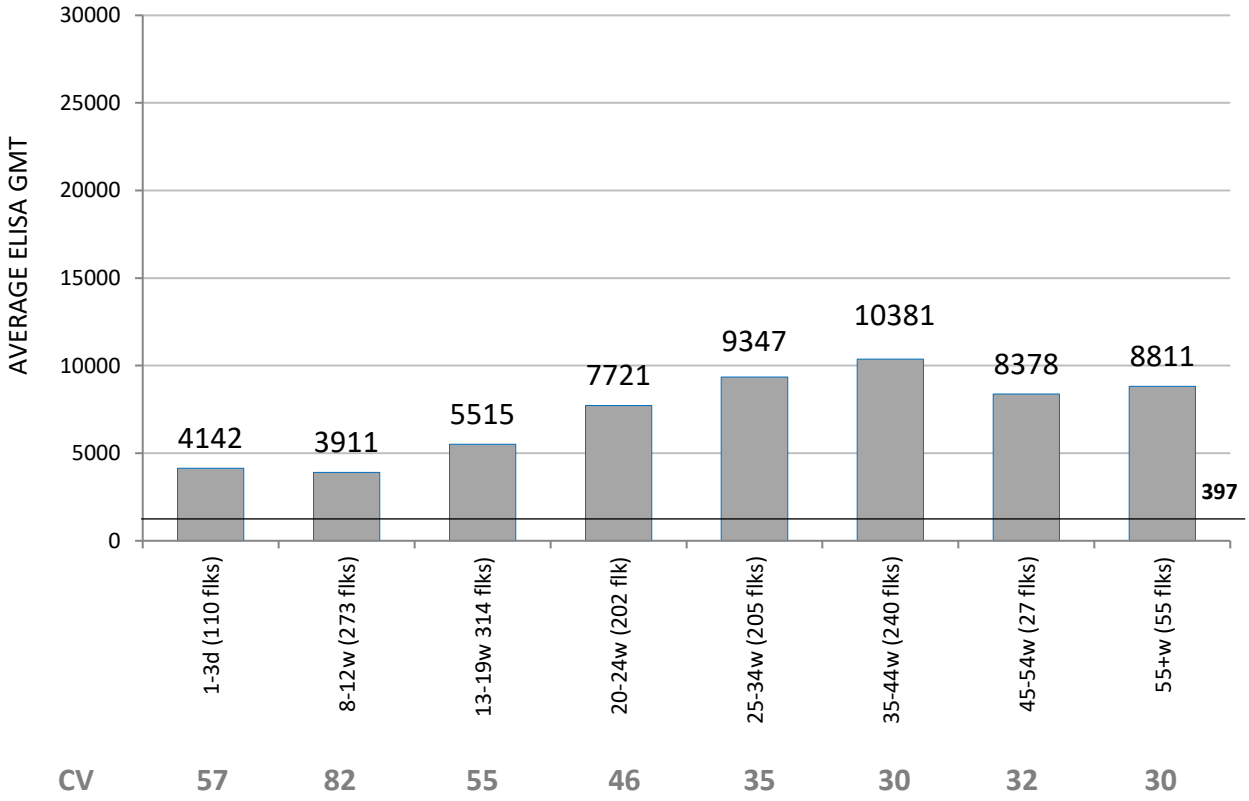


CV	n/a	74	52	47	38	36	29	42

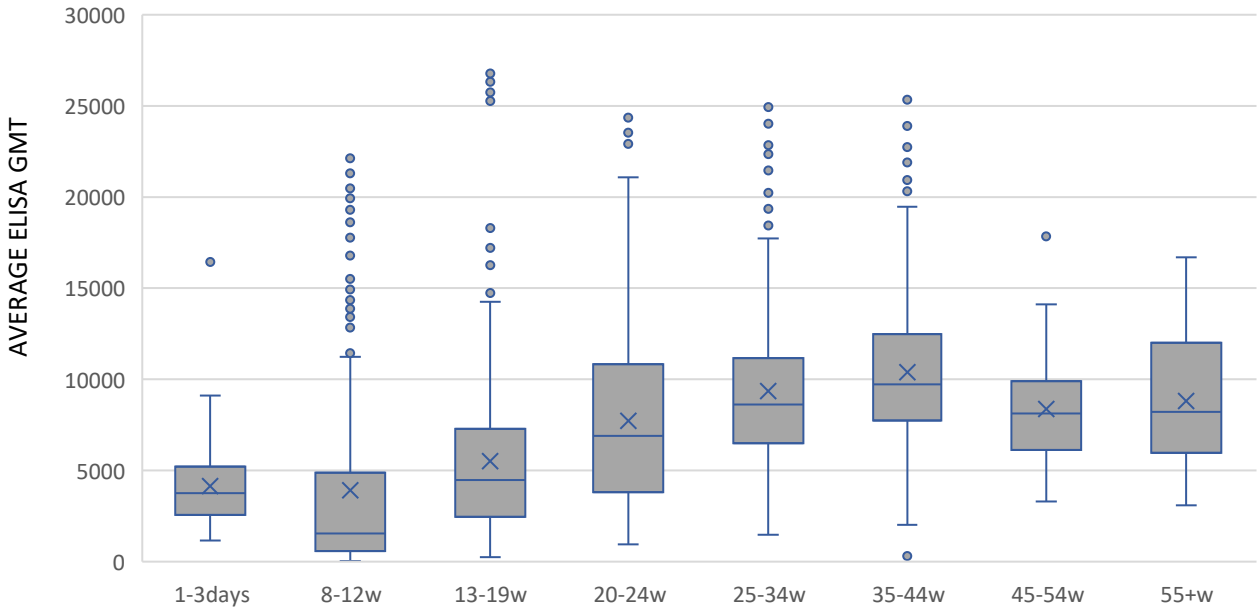


Breeder IBV titers and CVs by age

L-LP programs (Live vaccines in pullets and during production)

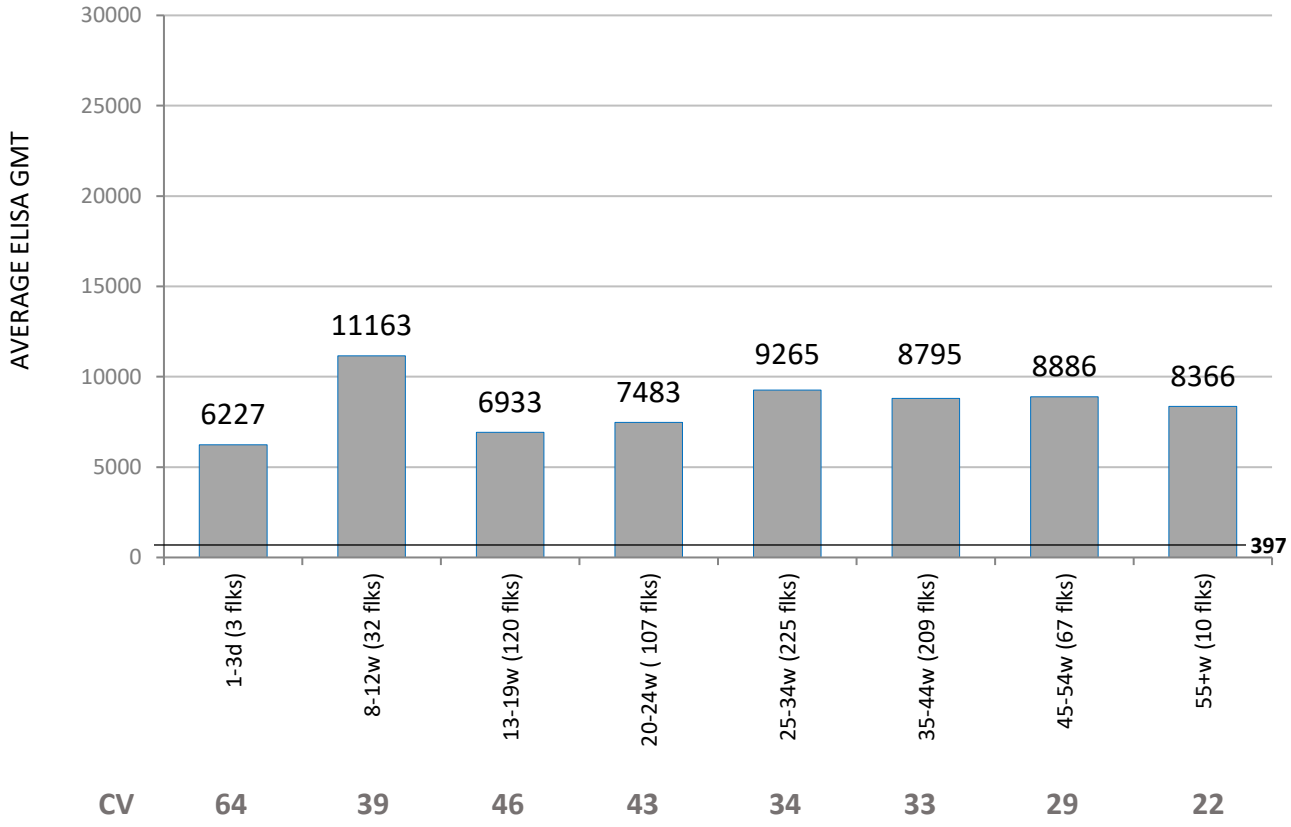


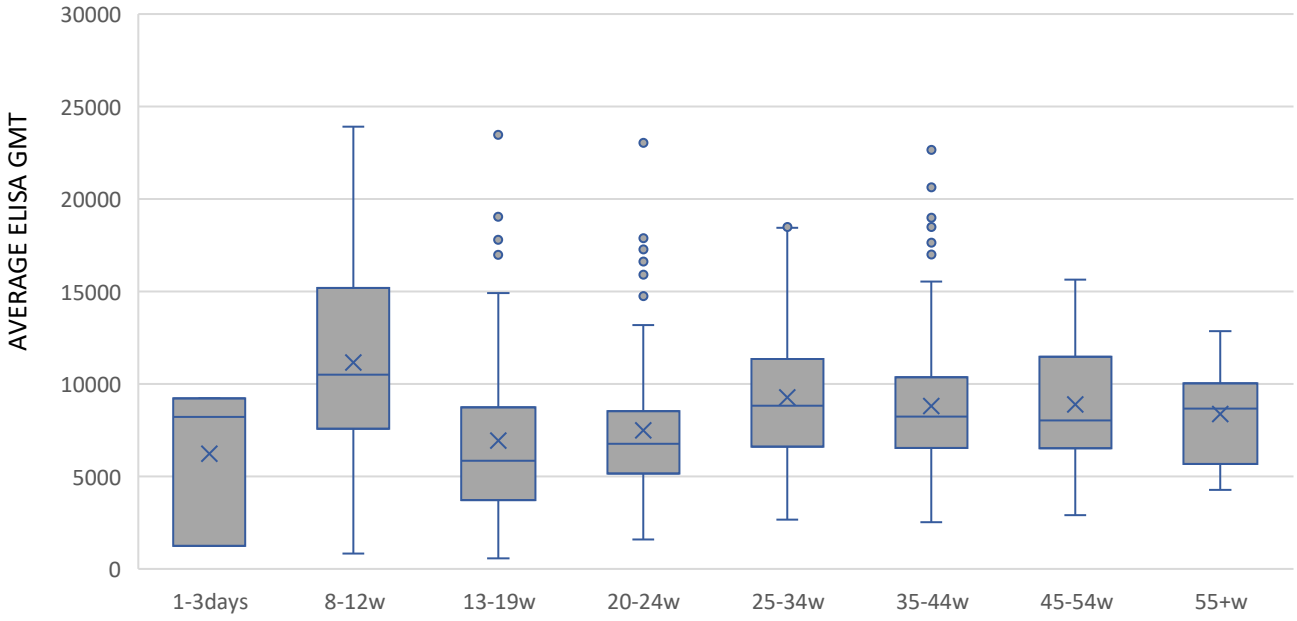
CV	57	82	55	46	35	30	32	30



Breeder IBV titers and CVs by age

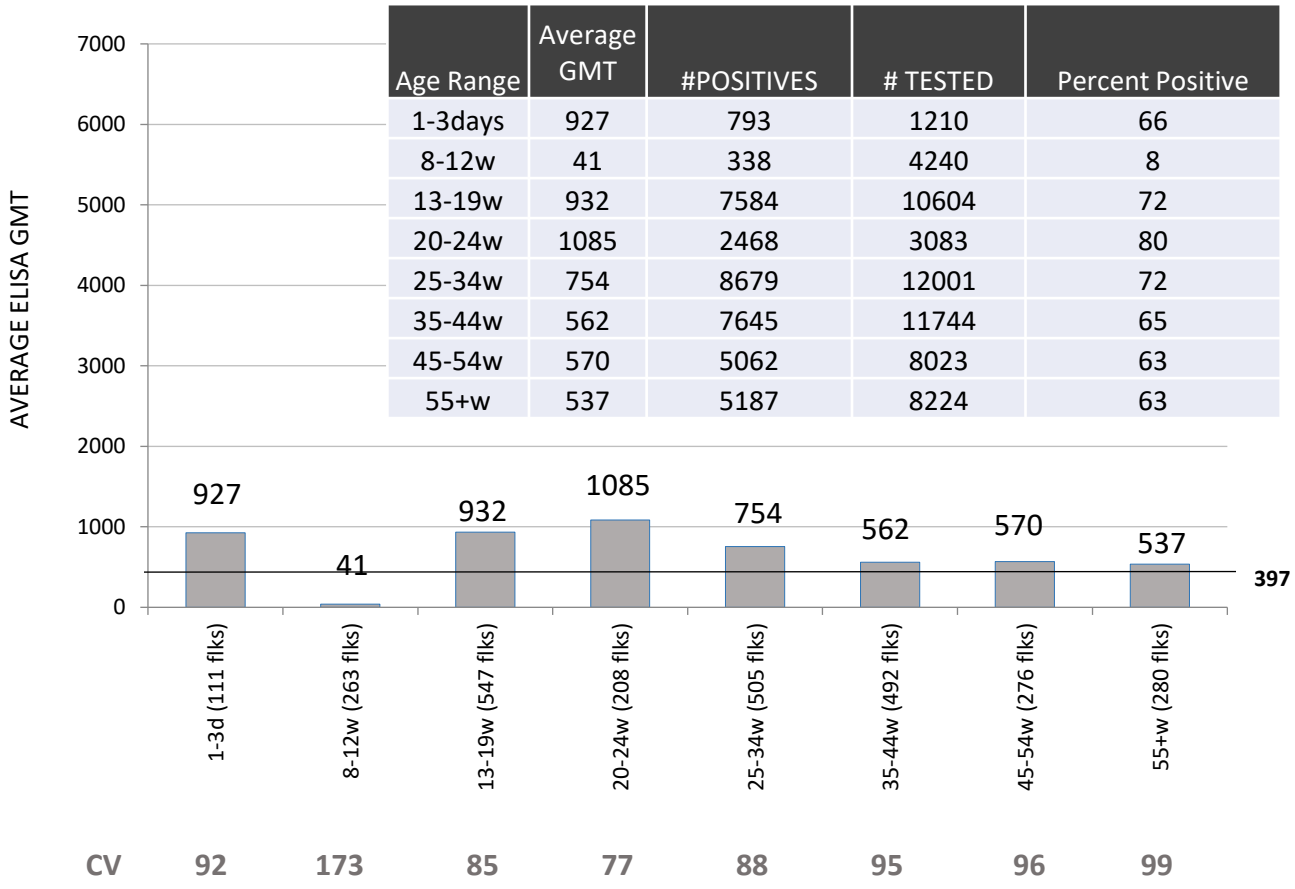
L-K programs (Live and inactivated vaccines in pullets)

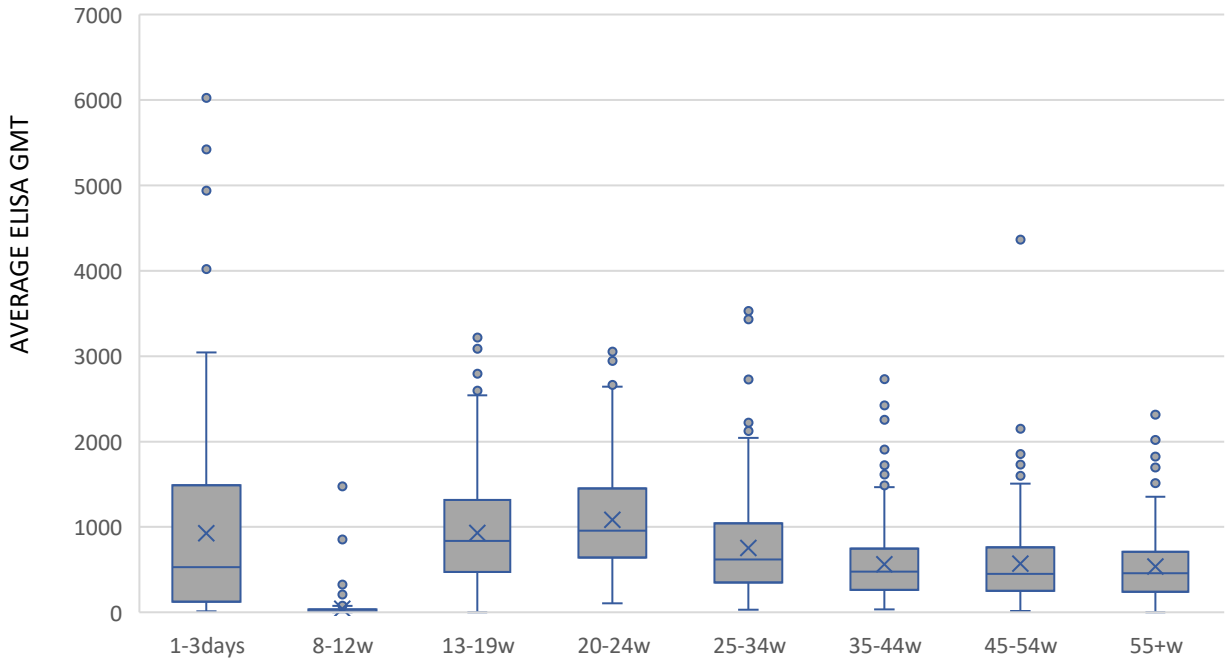




Breeder AE titers and CVs by age

Age Range	Average GMT	#POSITIVES	# TESTED	Percent Positive
1-3days	927	793	1210	66
8-12w	41	338	4240	8
13-19w	932	7584	10604	72
20-24w	1085	2468	3083	80
25-34w	754	8679	12001	72
35-44w	562	7645	11744	65
45-54w	570	5062	8023	63
55+w	537	5187	8224	63





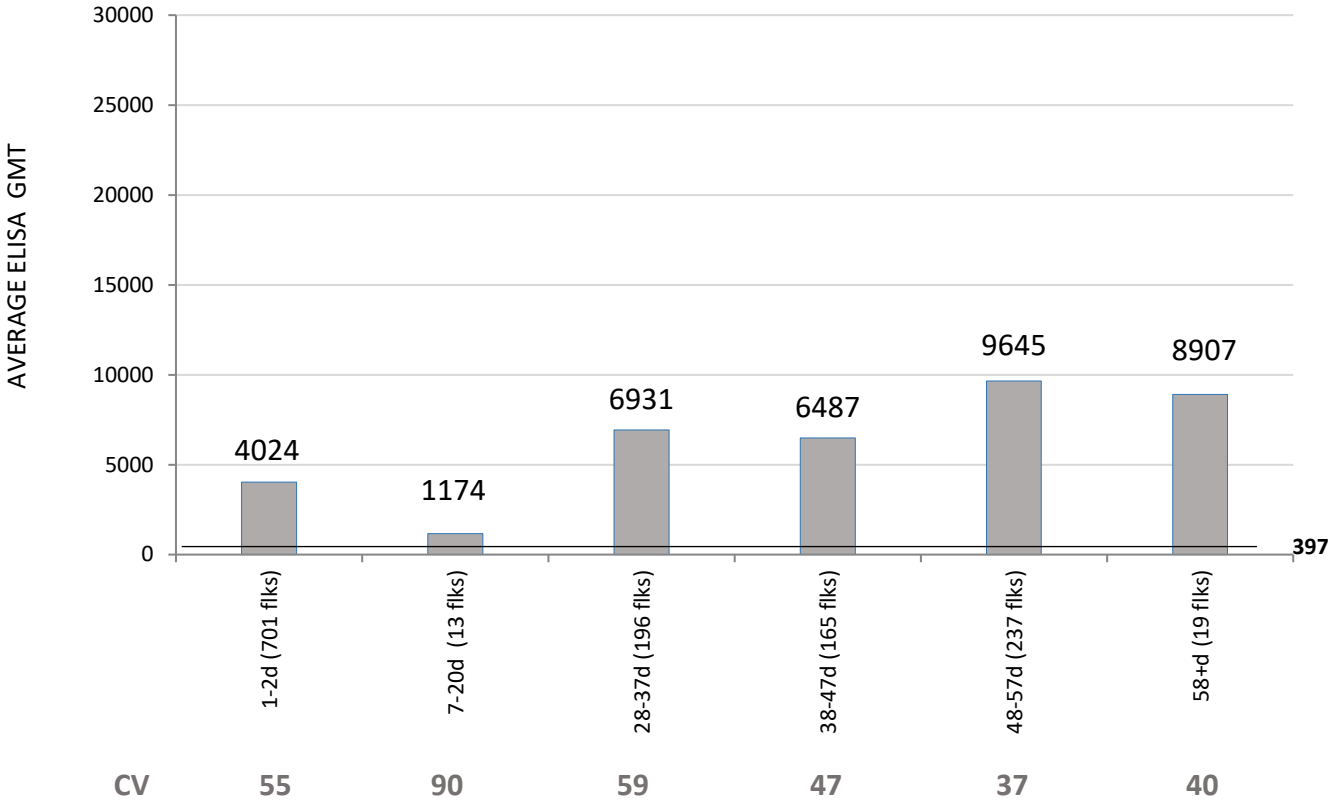
Breeder CAV % positive and CVs by age

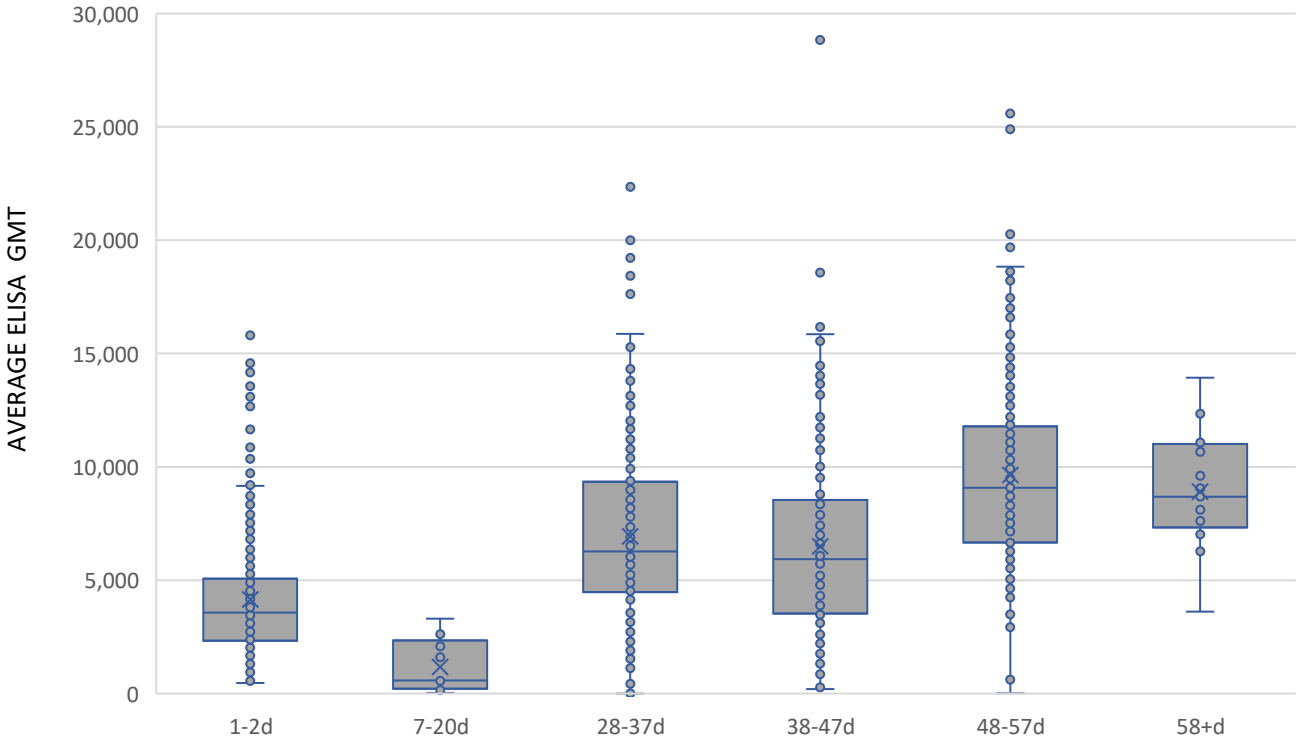
Age	# Flocks	% POSITIVE	CV
1-3days	98	95	102
8-12w	360	87	100
13-19w	1140	98	75
20-24w	208	99	72
25-34w	538	99	88
35-44w	476	99	98
45-54w	320	99	104
55+w	214	98	131

ELISA Titers in Broilers

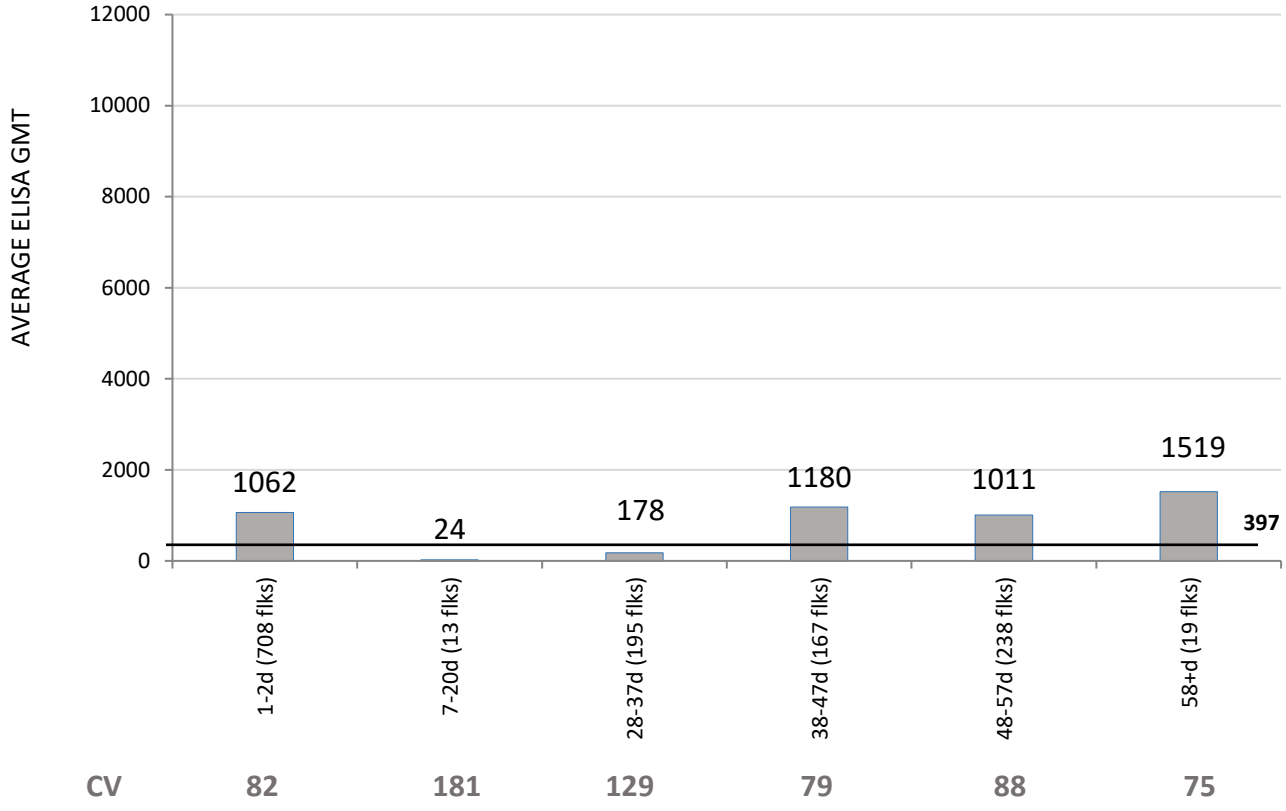
- Age ranges are divided in 6 groups: 1-2 days, 7-20 days, 28-37 days, 38-47 days, 48-57 days and 58+ days.
- GPLN receives very few broiler samples between 7 and 27 days of age. This age range reflects the maternal antibody decline after hatching.
- After 27 days of age, the increase in titers is due to a combination of vaccine response and field exposure.
- The number of samples per flock in this series is 10 or greater.
- Note that the y-axis range of values are the same on the bar graph and on the box plot found on the same page.

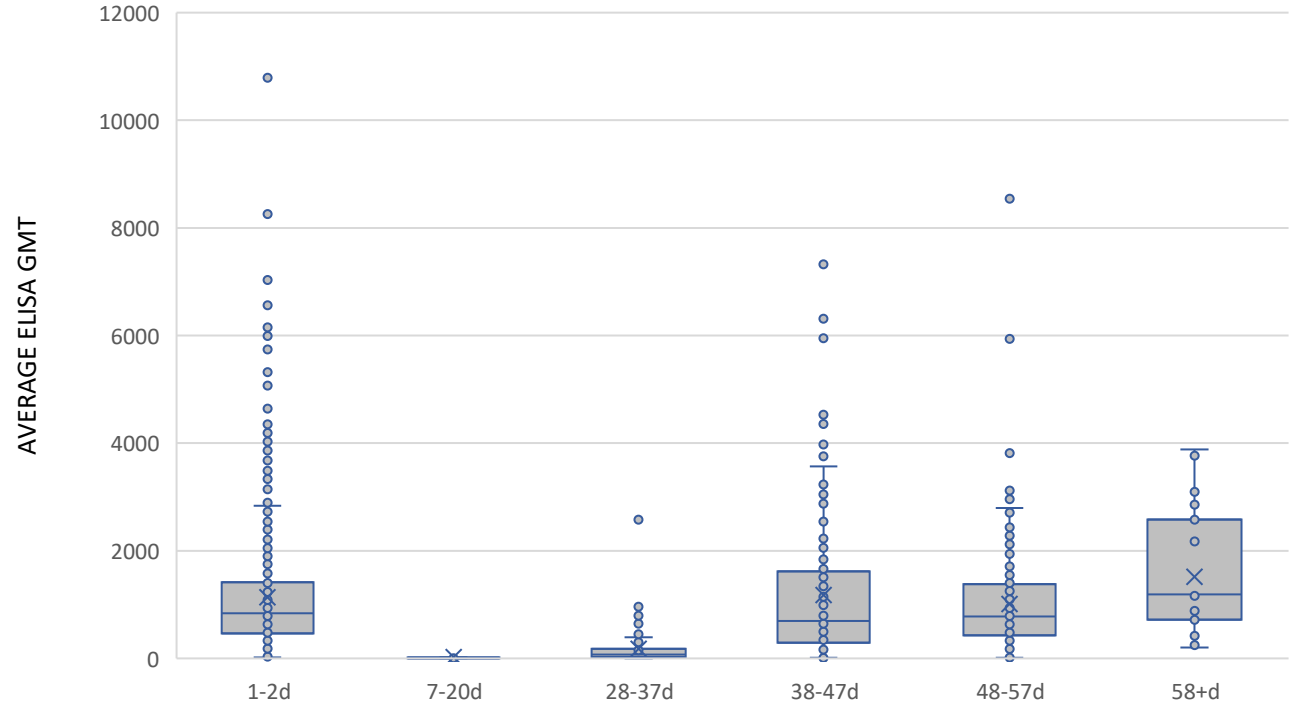
Broiler IBD-XR titers and CVs by age



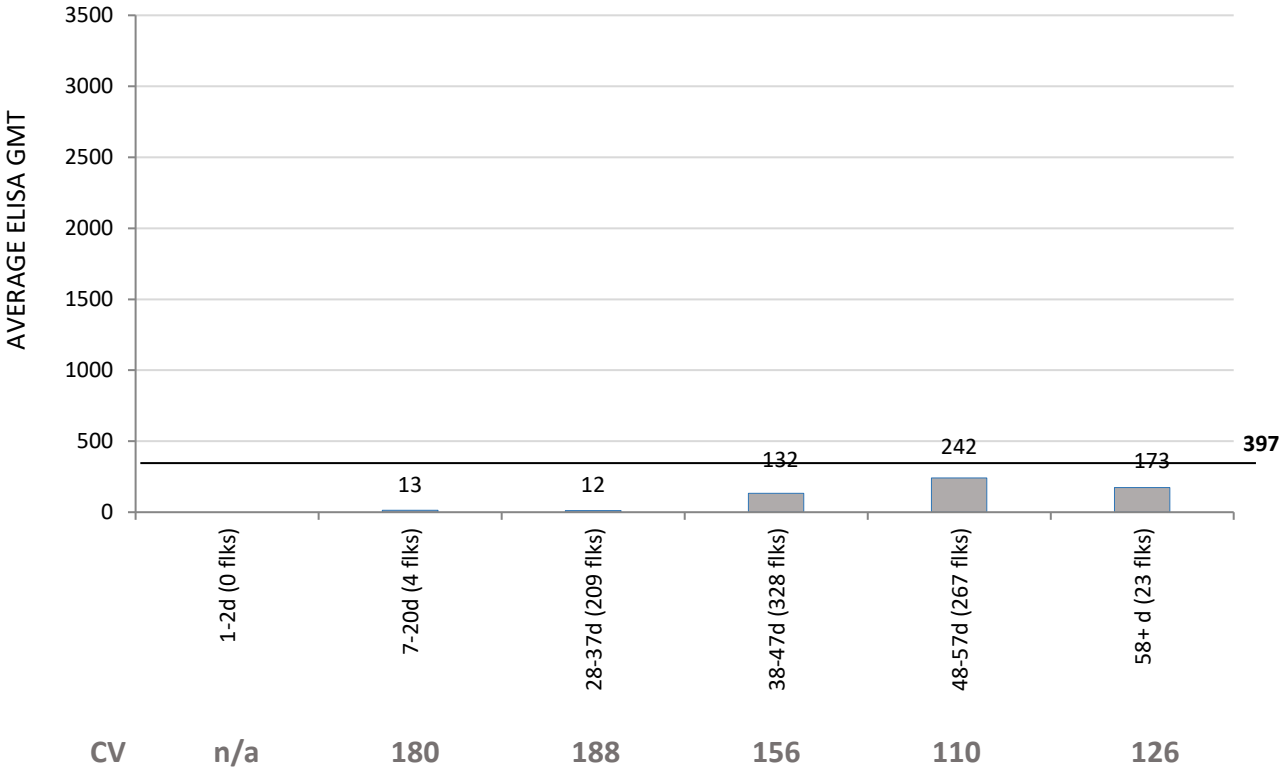


Broiler REO titers and CVs by age

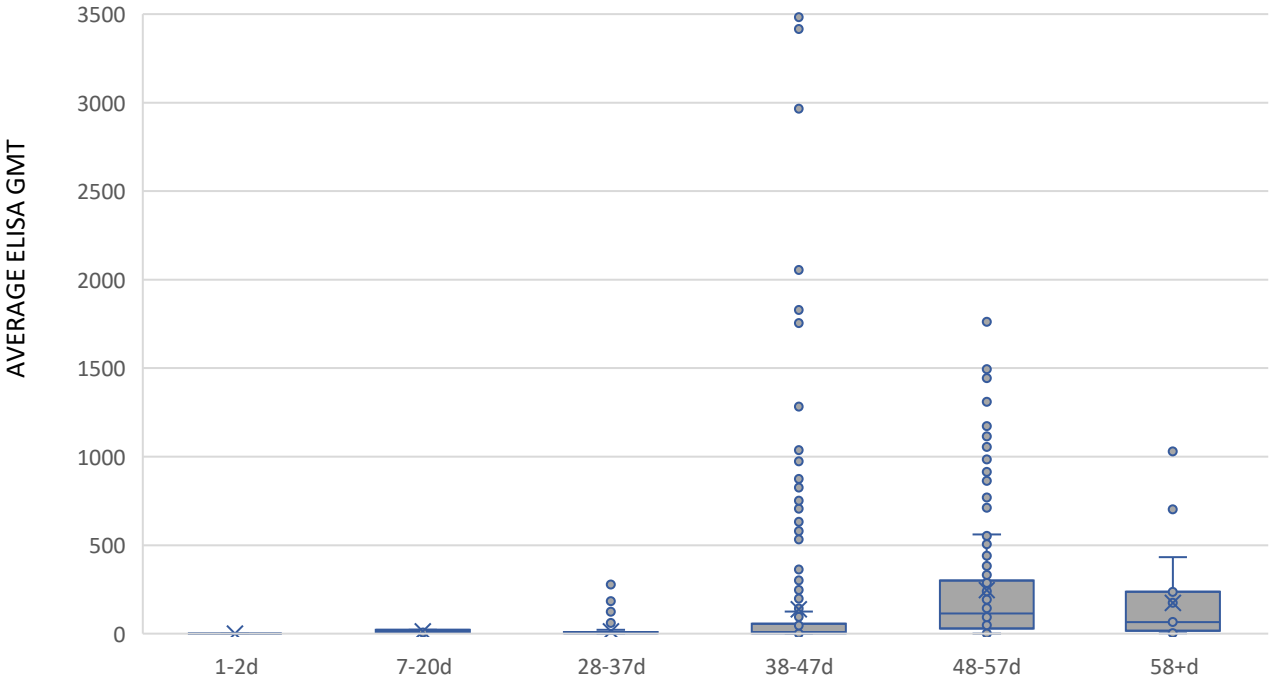




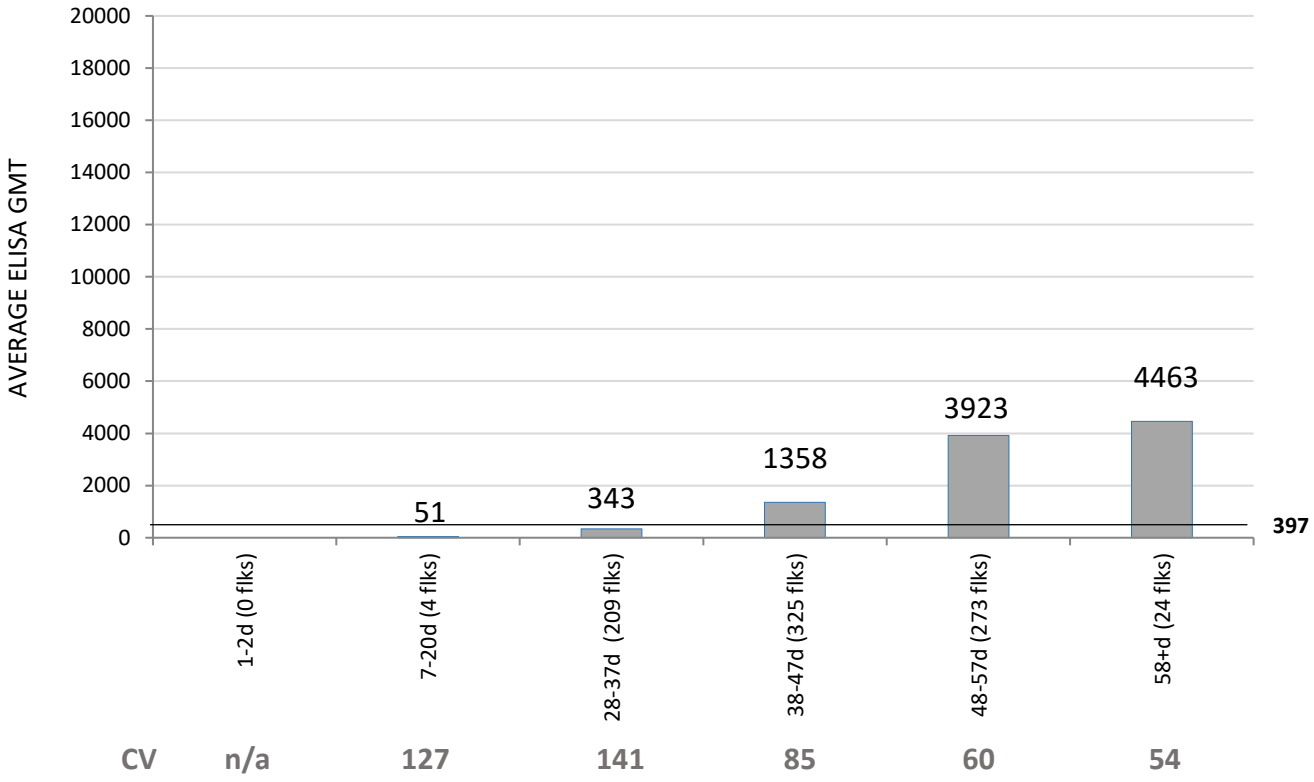
Broiler NDV titers and CVs by age

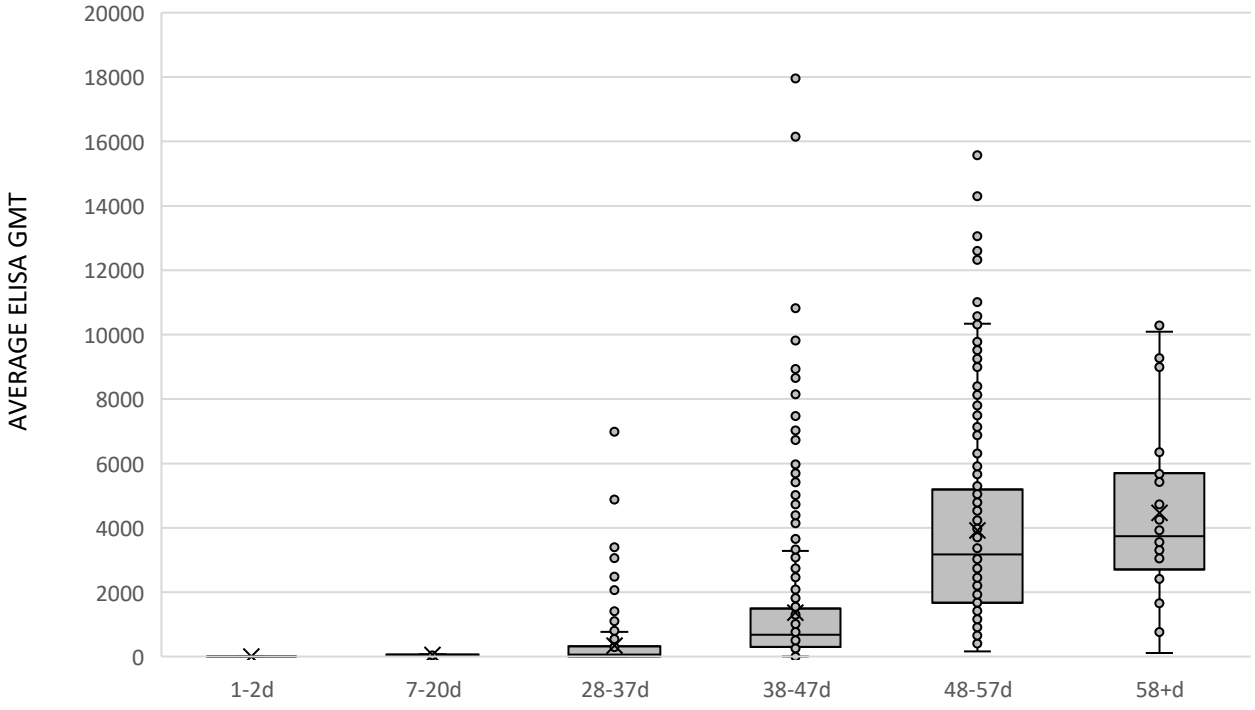


CV	n/a	180	188	156	110	126



Broiler IBV titers and CVs by age

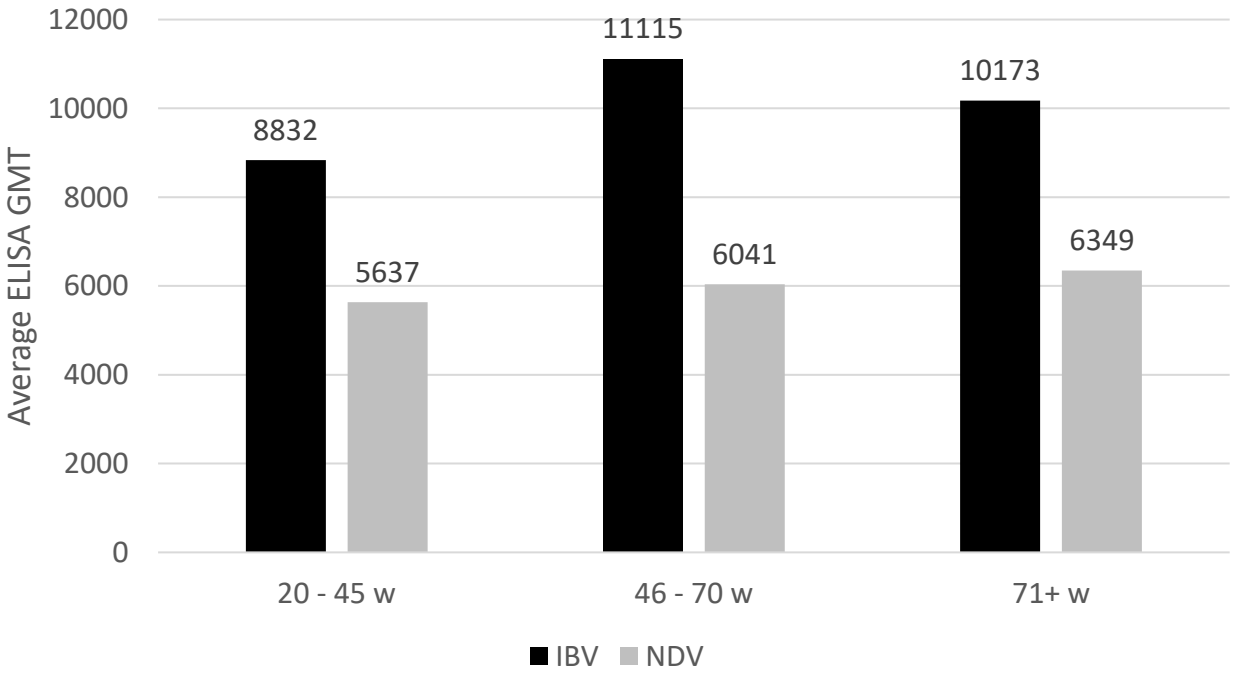




ELISA Titers in Commercial Layers

- Age ranges were kept the same as previous years.
- GPLN receives relatively few samples for vaccine monitoring from Georgia commercial layer flocks and Georgia commercial layer pullet flocks.
- The number of samples per flock in this series is 10 or greater.

Layer **IBV** & NDV Avg. GMT and CVs by age



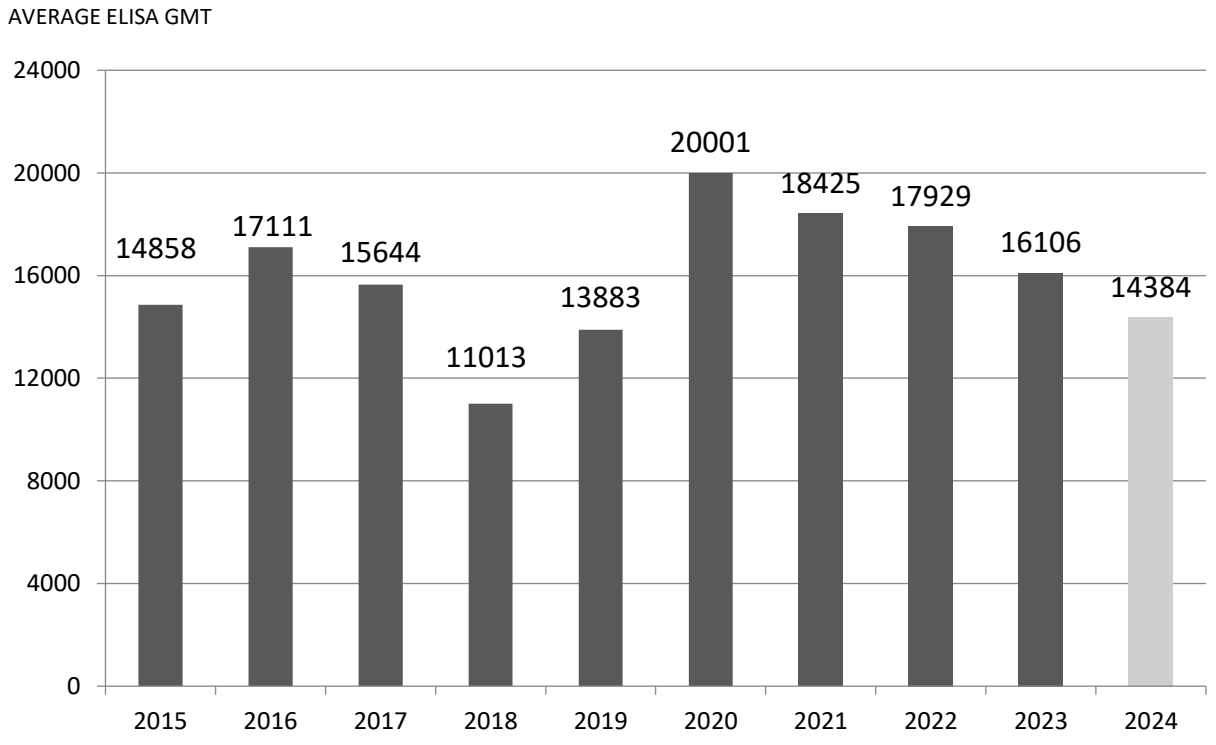
No flocks	**52**	32	**25**	19	**13**	12
CV	**38**	49	**30**	39	**33**	41

Trending of ELISA Titers over Time

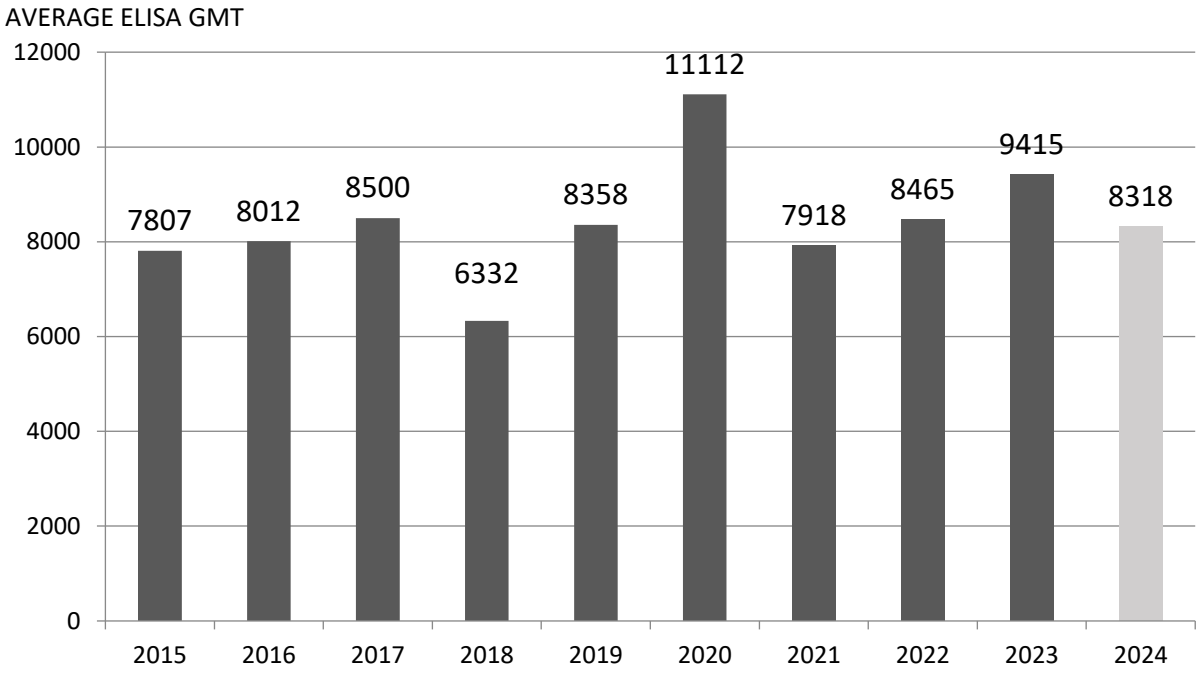
The following 5 graphs show trends over a 10-year period (2015-2024) for targeted agents and age ranges.

- Breeder IBD-XR titers at 22-26 weeks of age should be at their maximum. For that reason, this is a very popular age range for testing. Different vaccines are more immunogenic than others, and vaccination programs change over time, so that data point is interesting to compare year to year.
- Breeder REO titers at 22-26 weeks of age follow the same logic as IBD-XR titers. For REO, several companies use autogenous vaccines in addition to conventional ones, bringing the total number of REO inactivated vaccine injections to 3 or 4 in some cases.
- Breeder flocks are expected to seroconvert to AE before they start production. At 20-24 weeks, all birds and flocks should be positive and show their peak vaccine titer.
- Broiler processing age REO titers are mostly an indication of REO field exposure, and so are broiler processing age IBV titers.

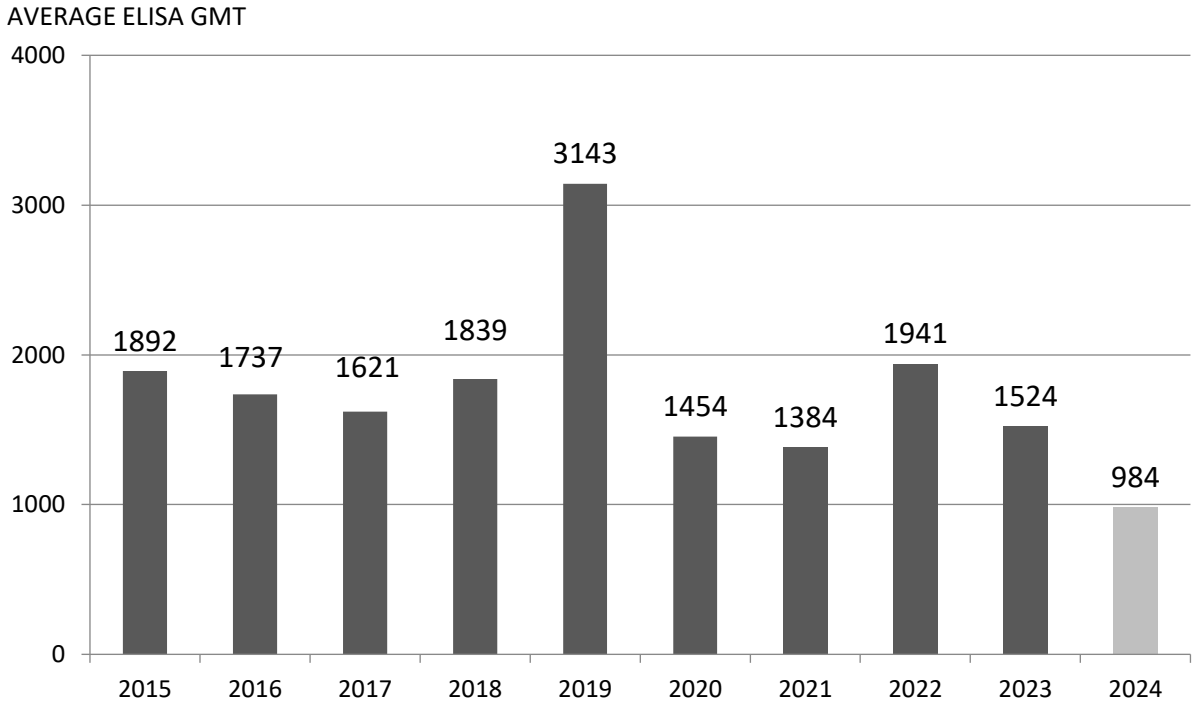
GA 22-26w IBD-XR titers in Breeders over time



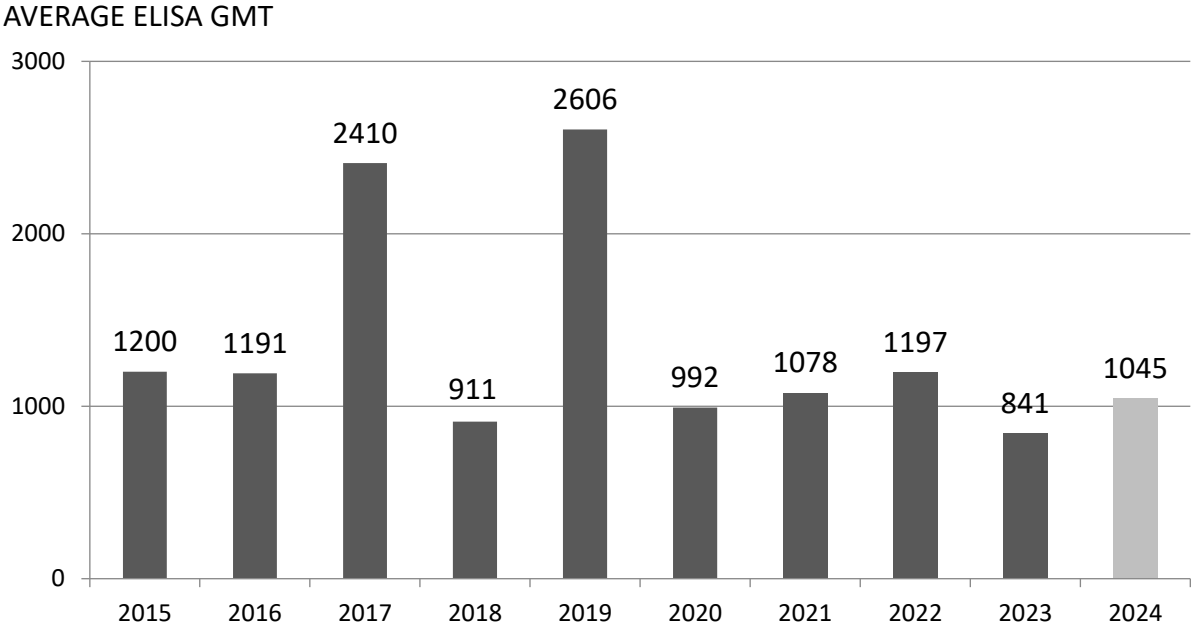
GA 22-26w REO titers in Breeders over time



GA 20-24w AE titers in Breeders over time



GA Processing Age (35 days +) REO titers in Broilers over time



GA Processing Age (35 days +) IBV titers in Broilers over time