

ELISA Titers in Georgia Poultry Flocks

2022-2023



ELISA Titers in Georgia Poultry Flocks

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 **2022 and 2023 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.

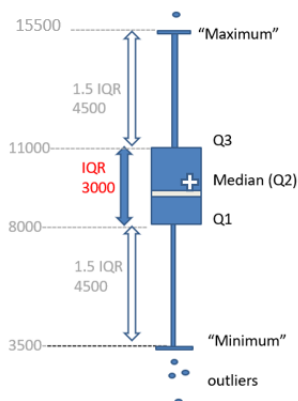
BAR GRAPHS:

- 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 quartile 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 or in other countries.

ENJOY!

Len Chappell, Dr. Kathleen Sary and Dr. Louise Dufour-Zavala

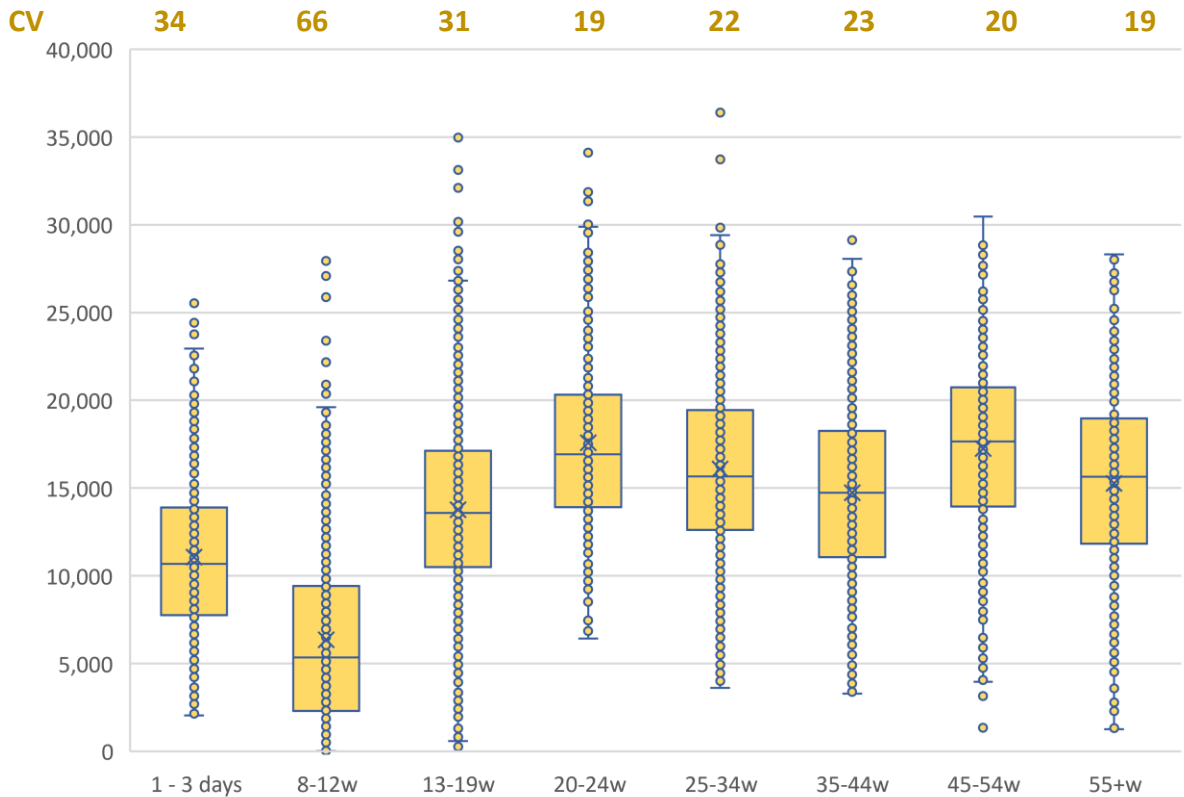
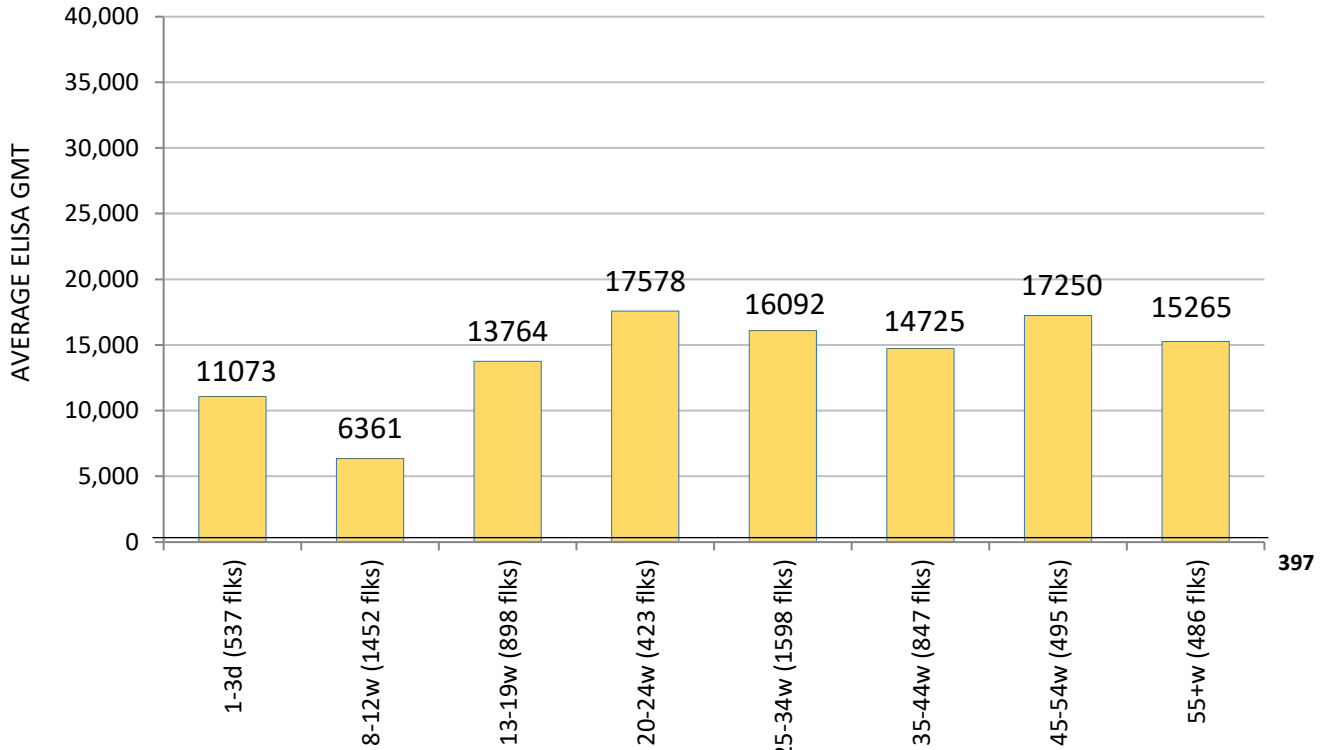
Special thanks to:

Brenda Glidewell
Anita Hamrick
Bethany Coggin
GPLN Serology Department
Dr Roy Berghaus
Dr Luis Gomez
Dr Lydia Atherton
Dr Dave Fernandez
Dr Guillermo Zavala
Alexandra Hovan

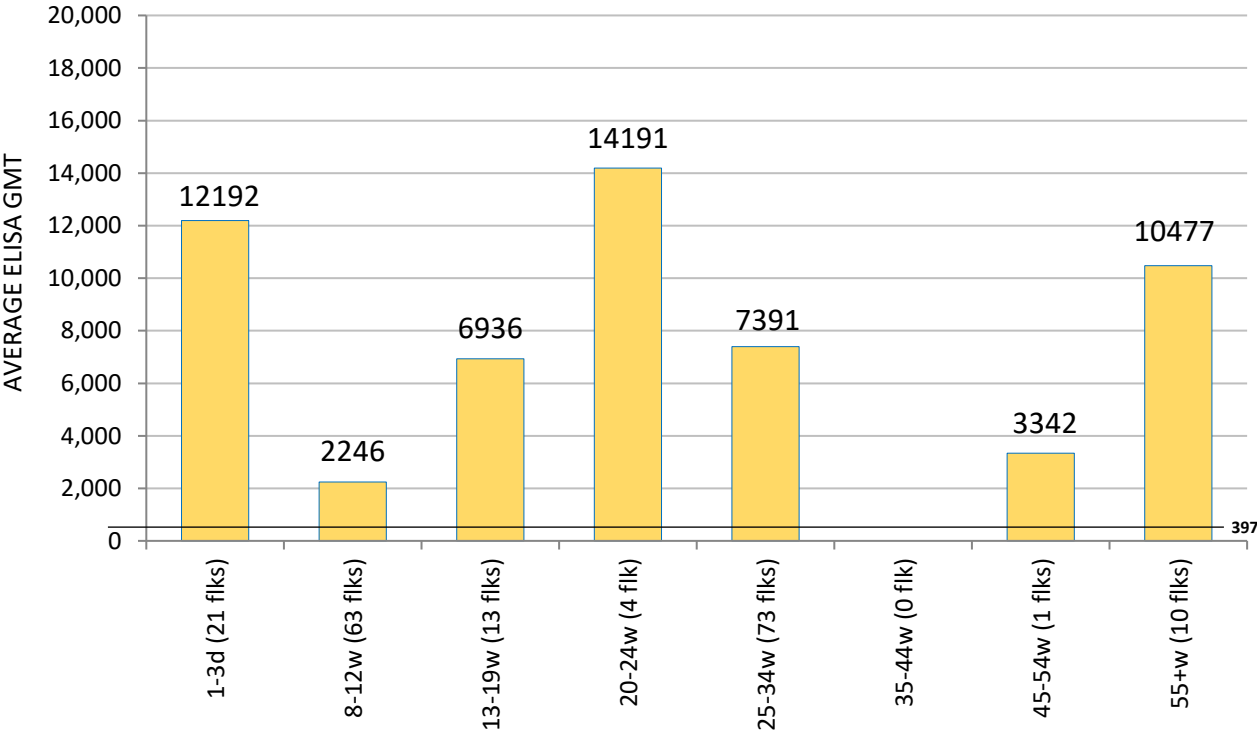
ELISA Titers in Broiler Breeders

- Age ranges are the same as for recent 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 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.*
- All complexes represented in this report are vaccinating their pullets twice with inactivated vaccines.
- The breeder NDV and IBV data is split between 2 vaccination strategies:
 1. complexes that vaccinate pullets only with live vaccines (L-PO for LIVE-PULLETS ONLY),
 2. complexes that use live vaccines followed by inactivated vaccines in pullets (L-K for LIVE and KILLED vaccines in pullets).
- The CAV data is presented in tabular form and the % positive birds are included in the tables.
- 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.

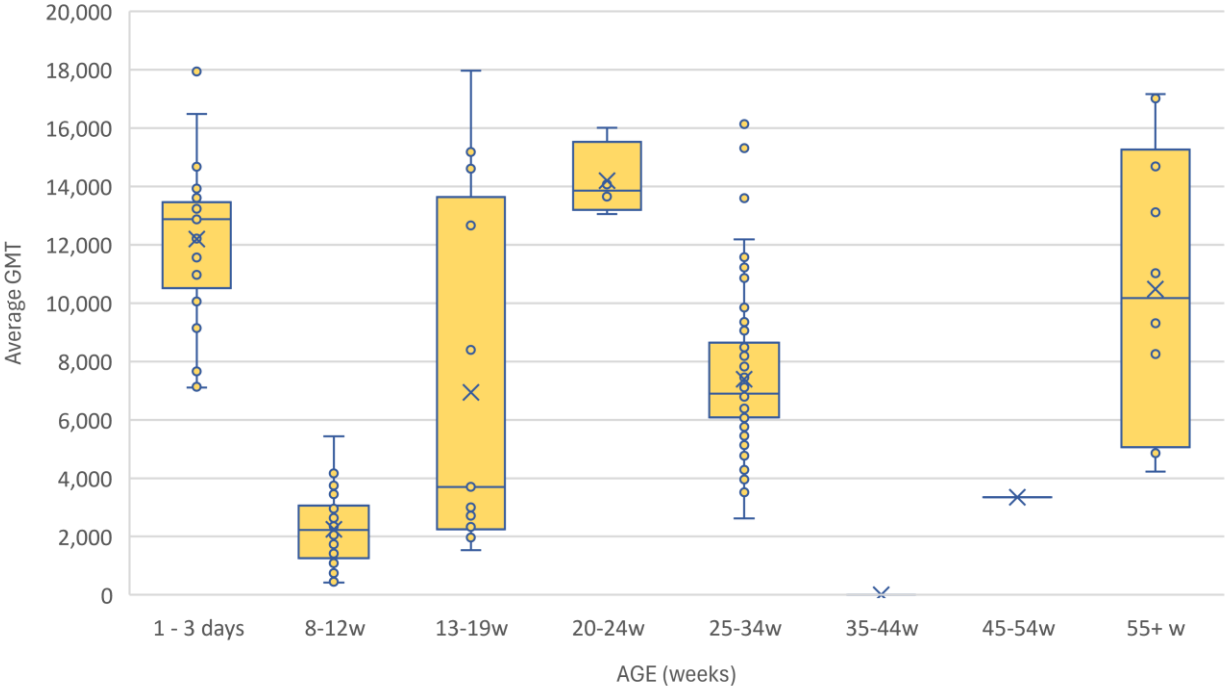
Breeder **IBD-XR** titers and CVs by age



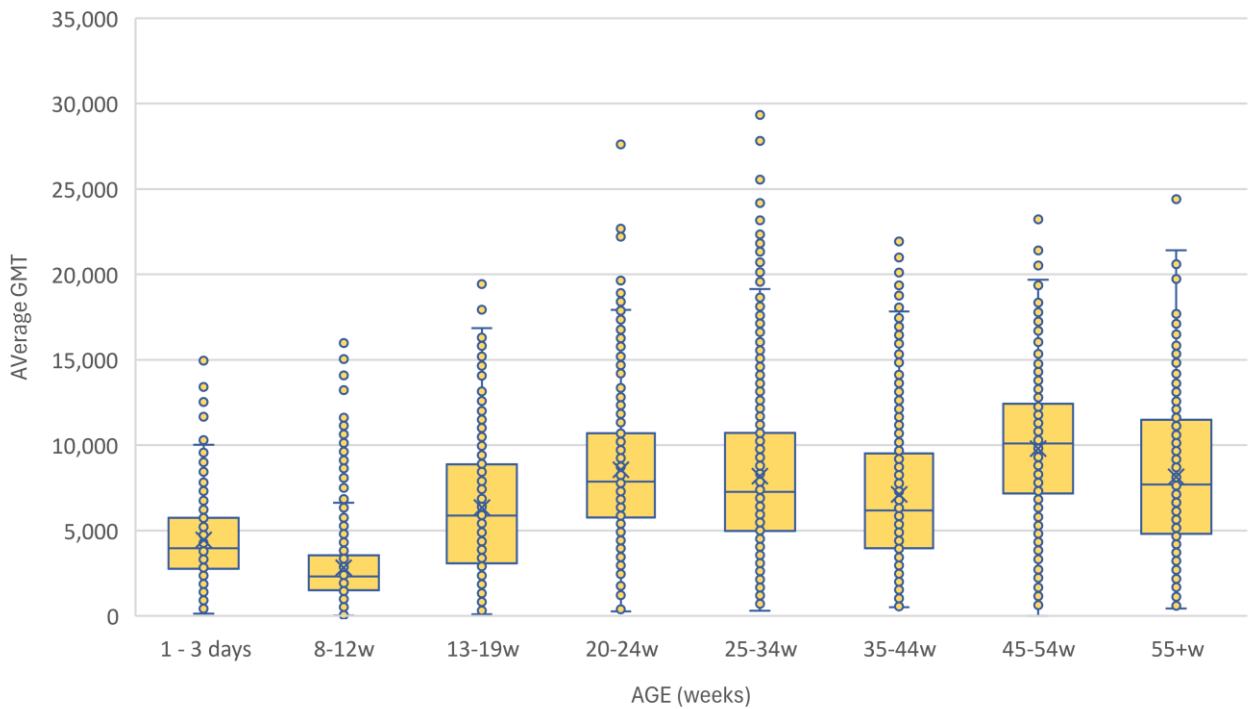
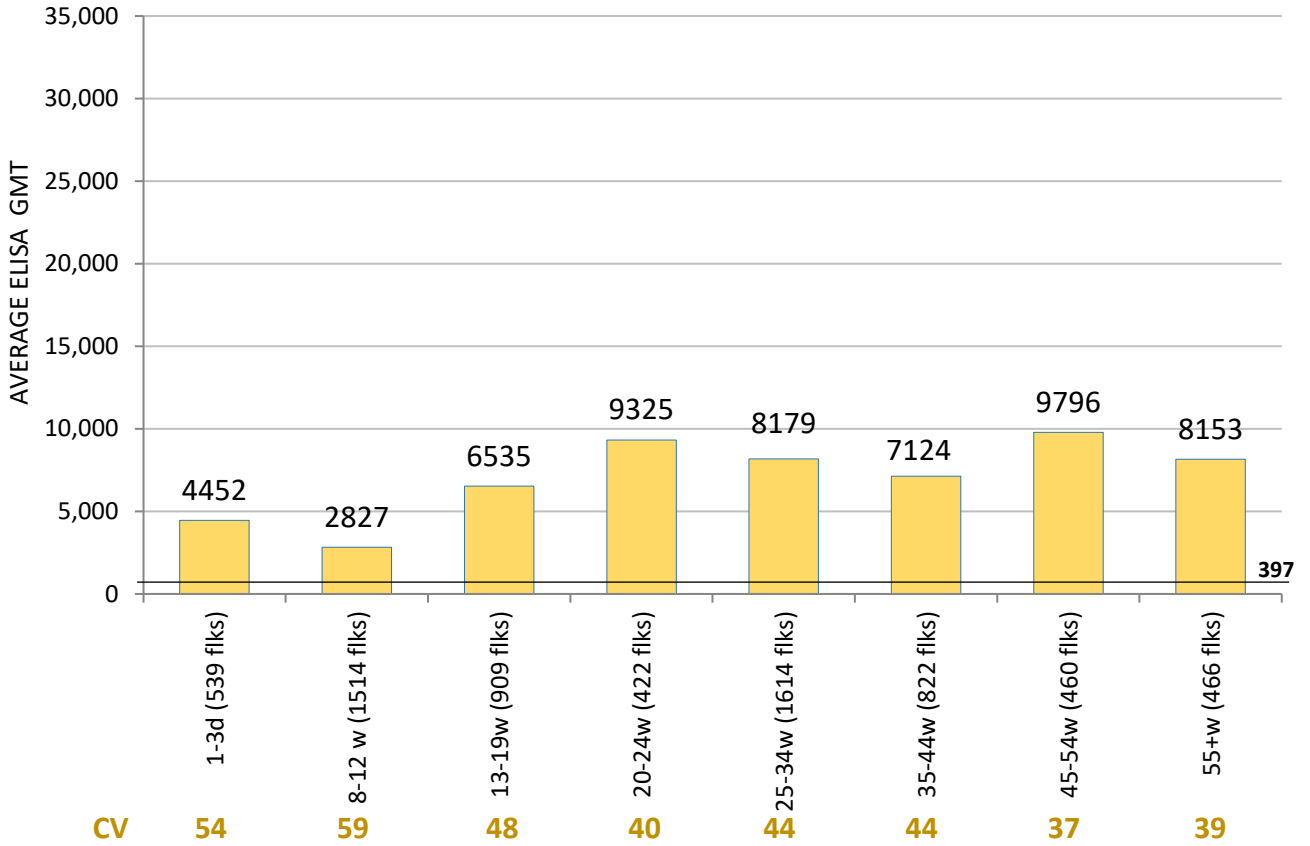
Breeder IBD-Classic titers and CVs by age



CV **22** **51** **49** **28** **34** **79** **10**

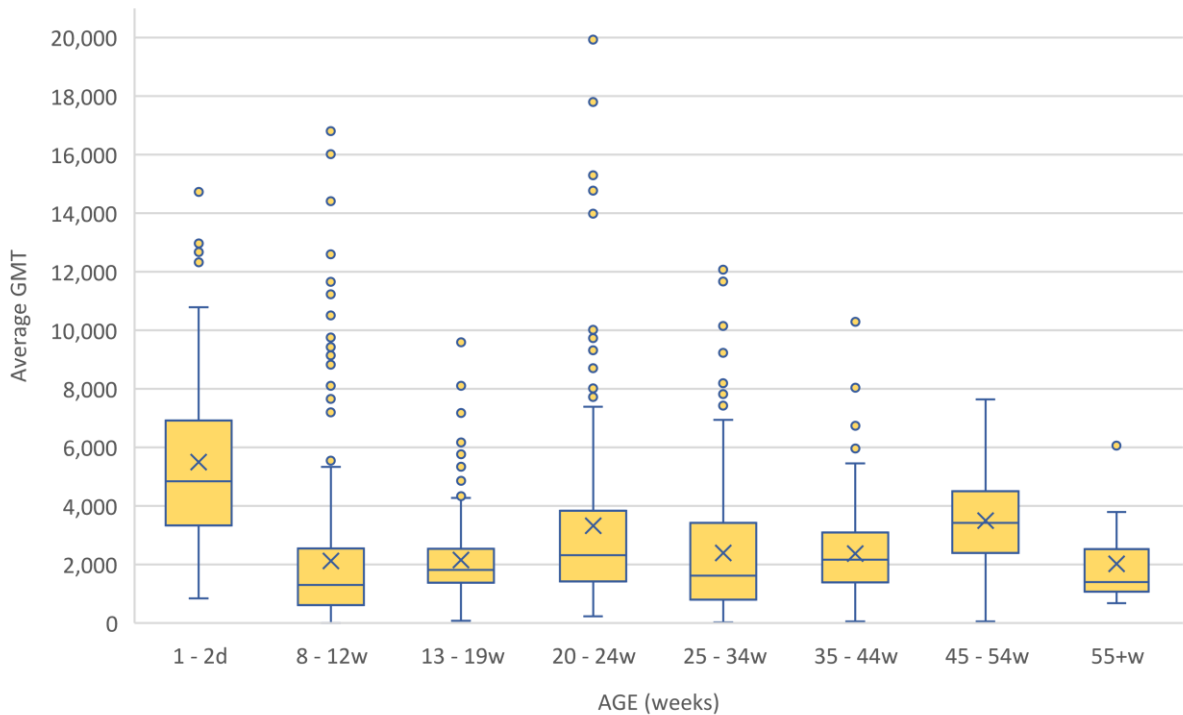
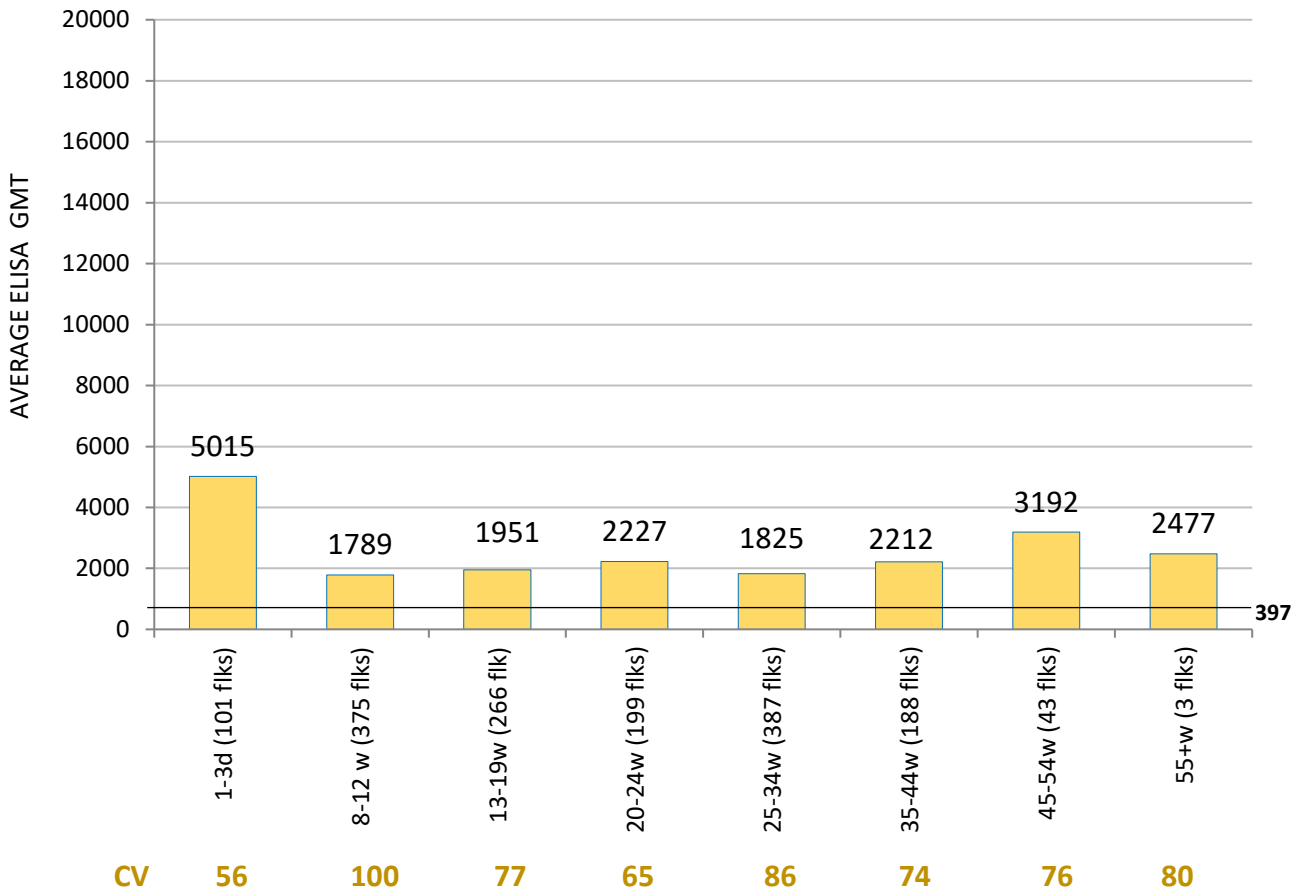


Breeder REO titers and CVs by age



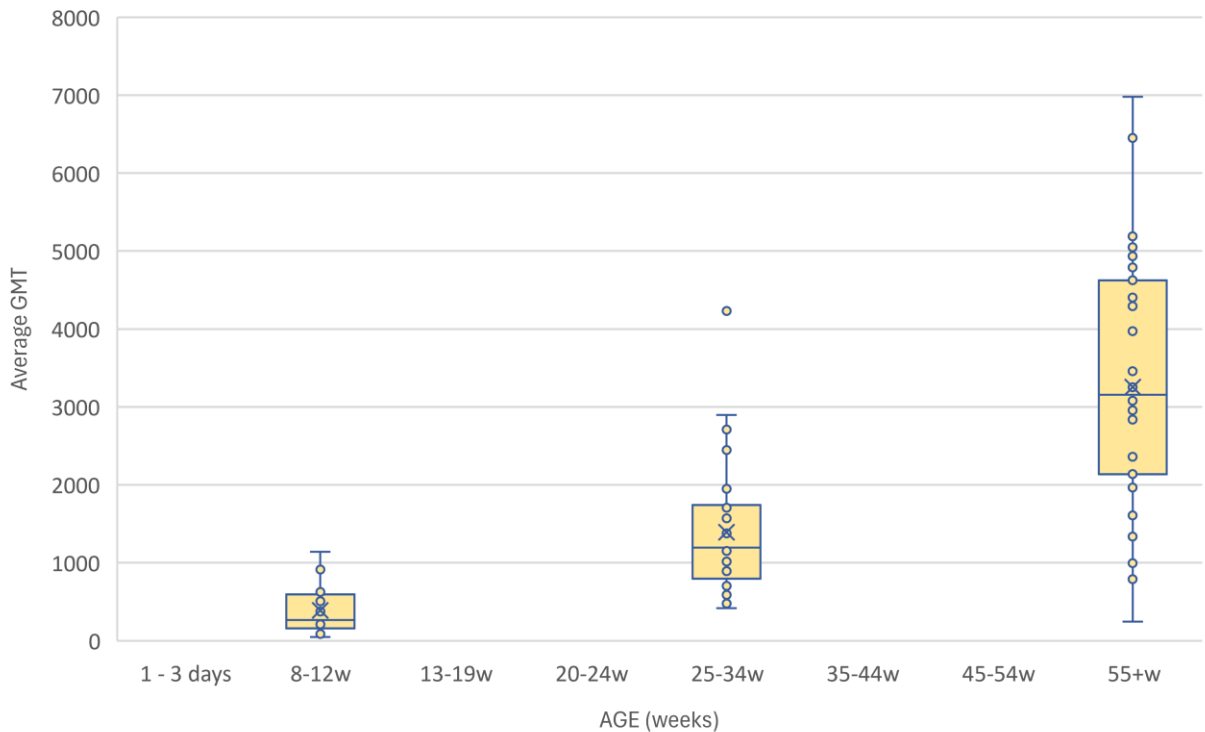
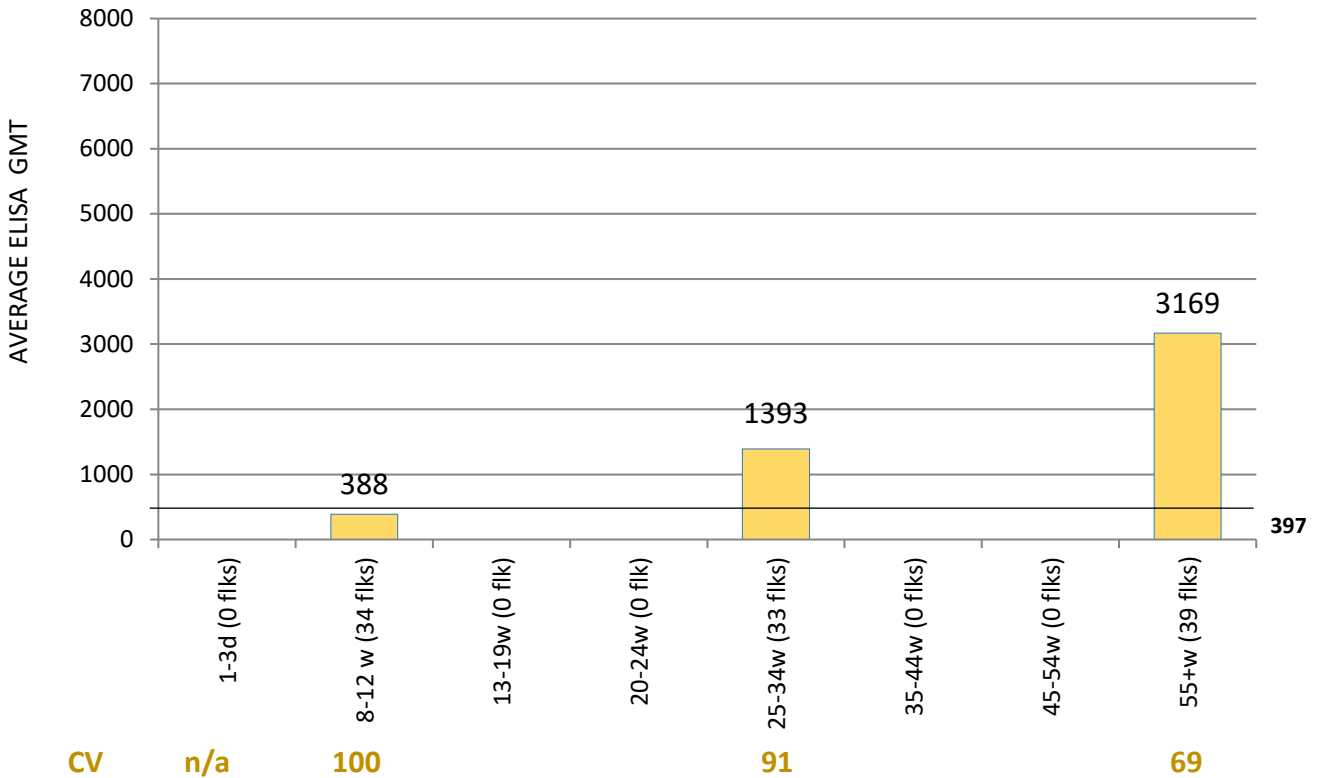
Breeder NDV titers and CVs by age

Companies Vaccinating with the **L-PO** programs



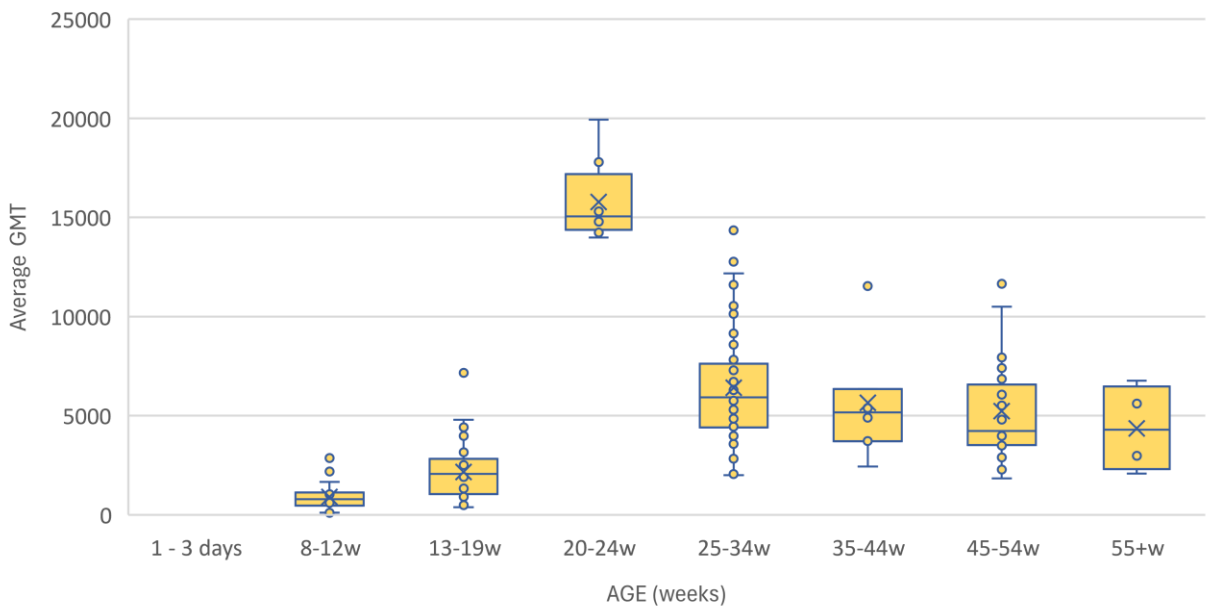
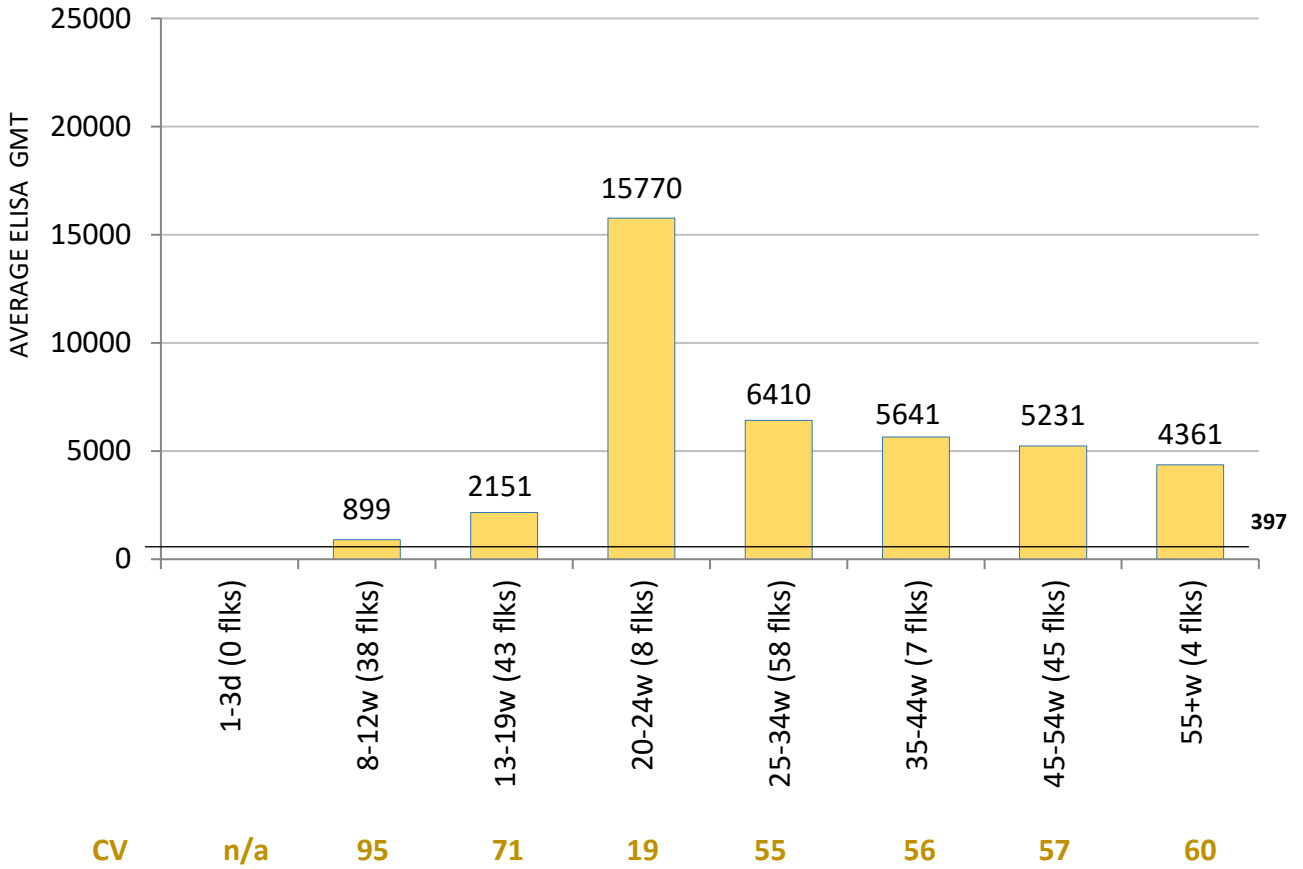
Breeder NDV titers and CVs by age

Companies Vaccinating with the **L-LP** programs



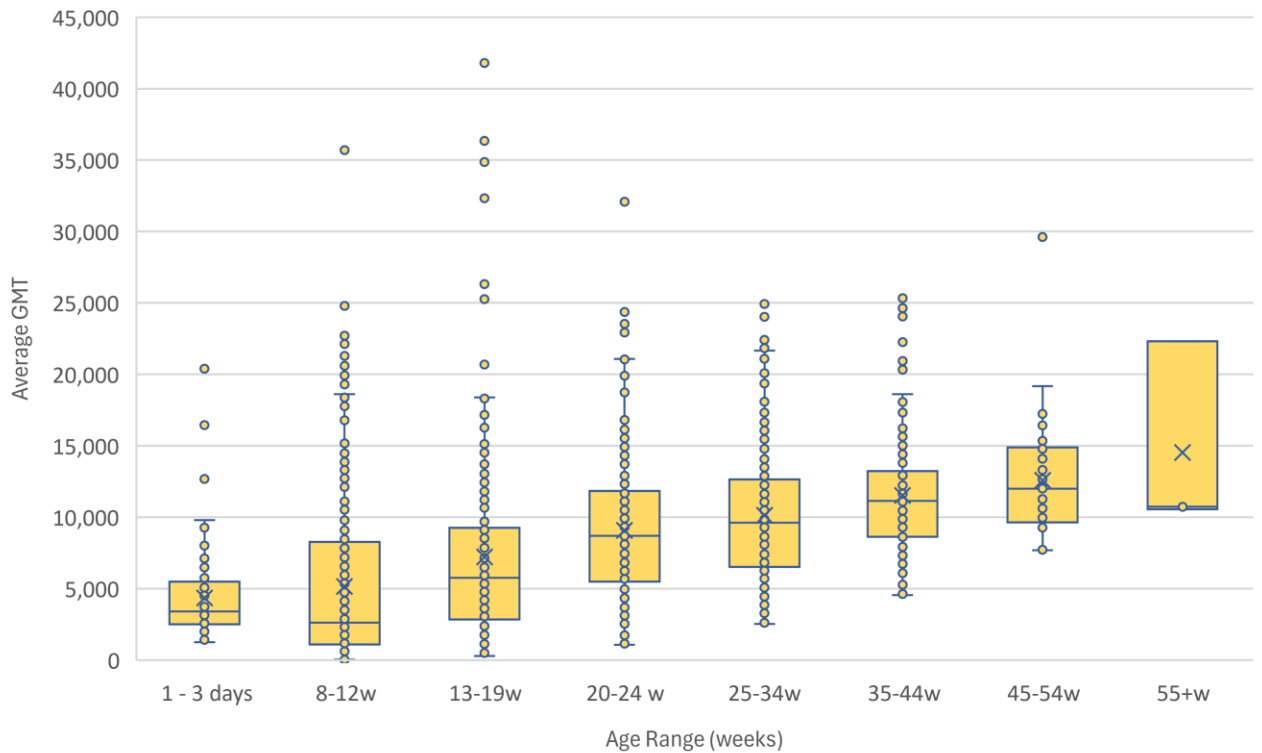
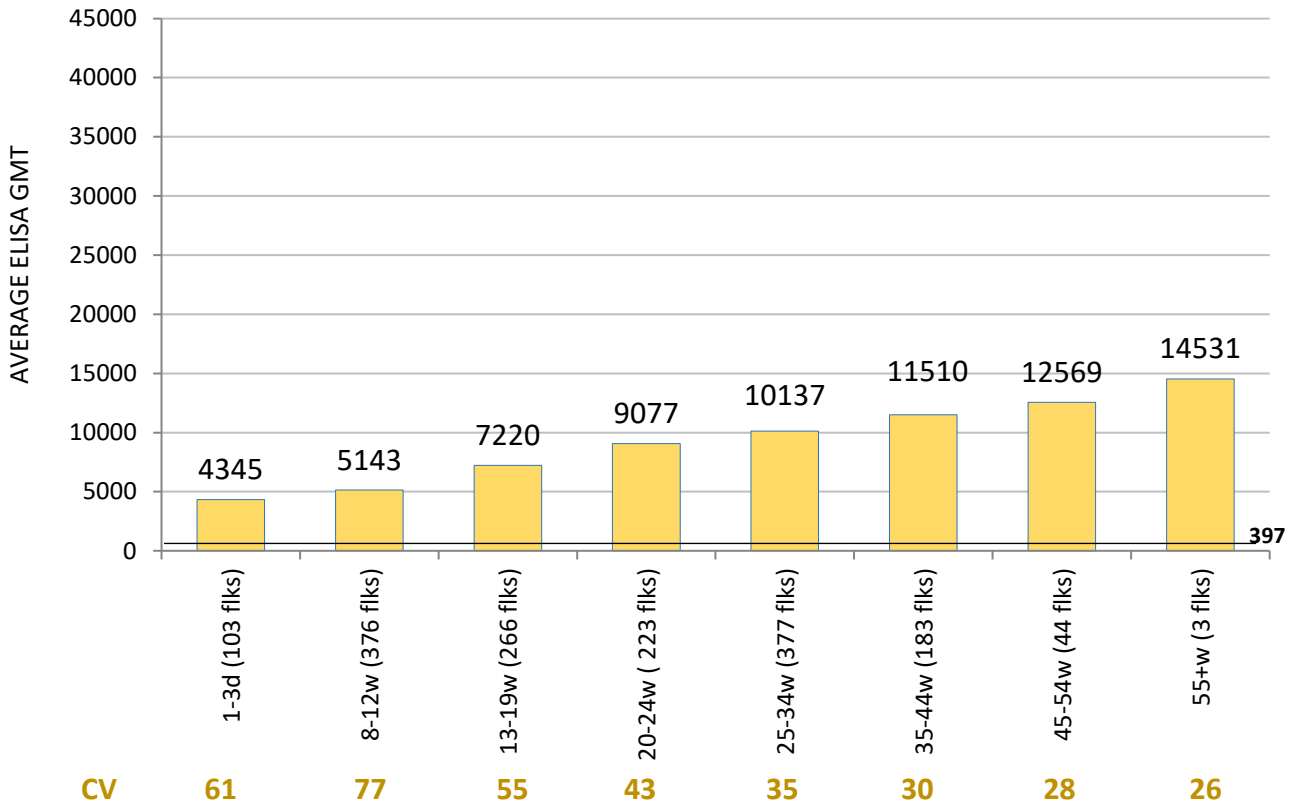
Breeder NDV titers and CVs by age

Companies Vaccinating with L-K Programs



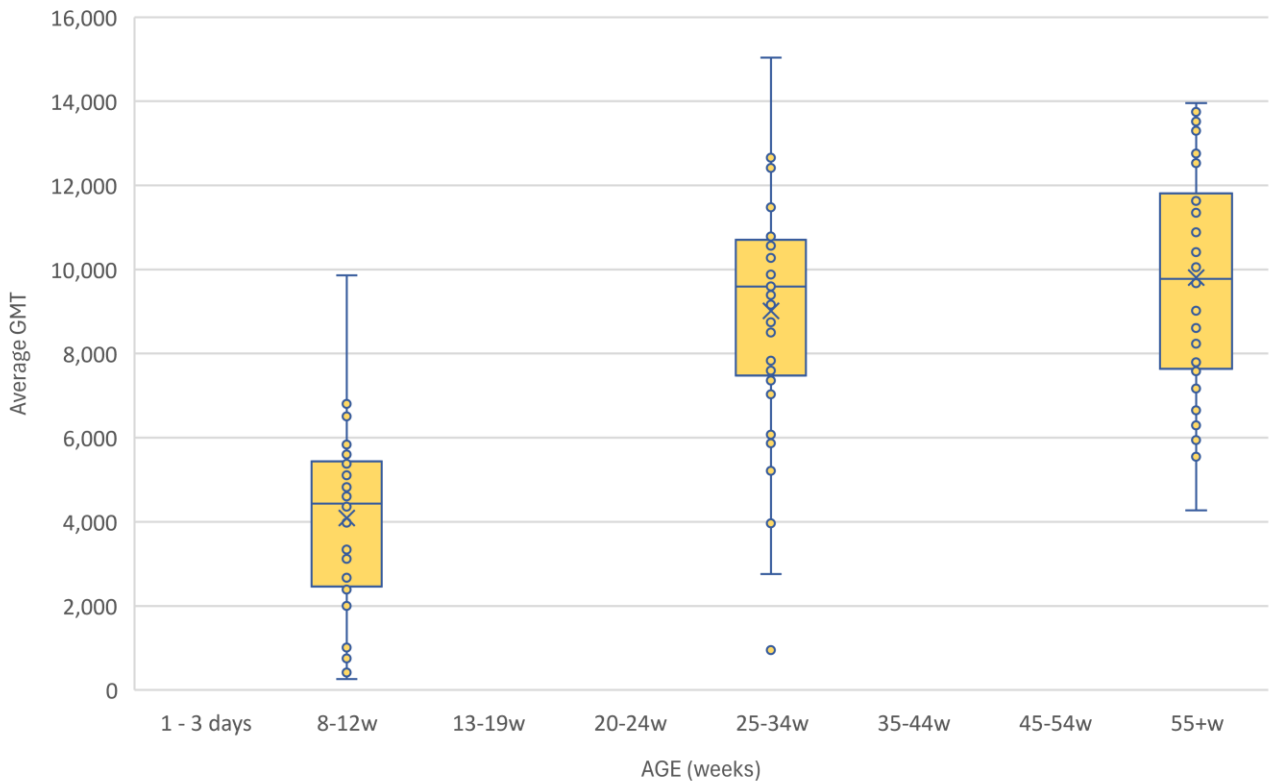
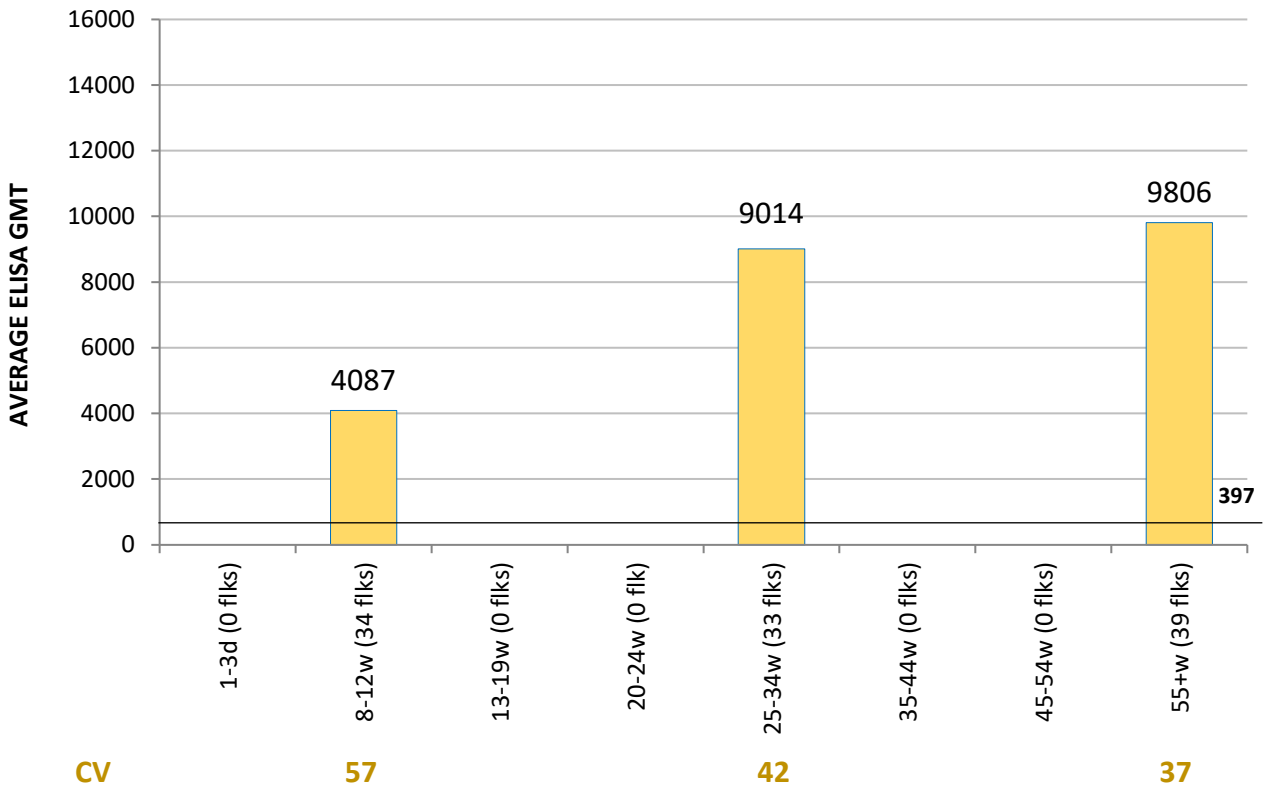
Breeder IBV titers and CVs by age

Complexes Vaccinating with the **L-PO** programs



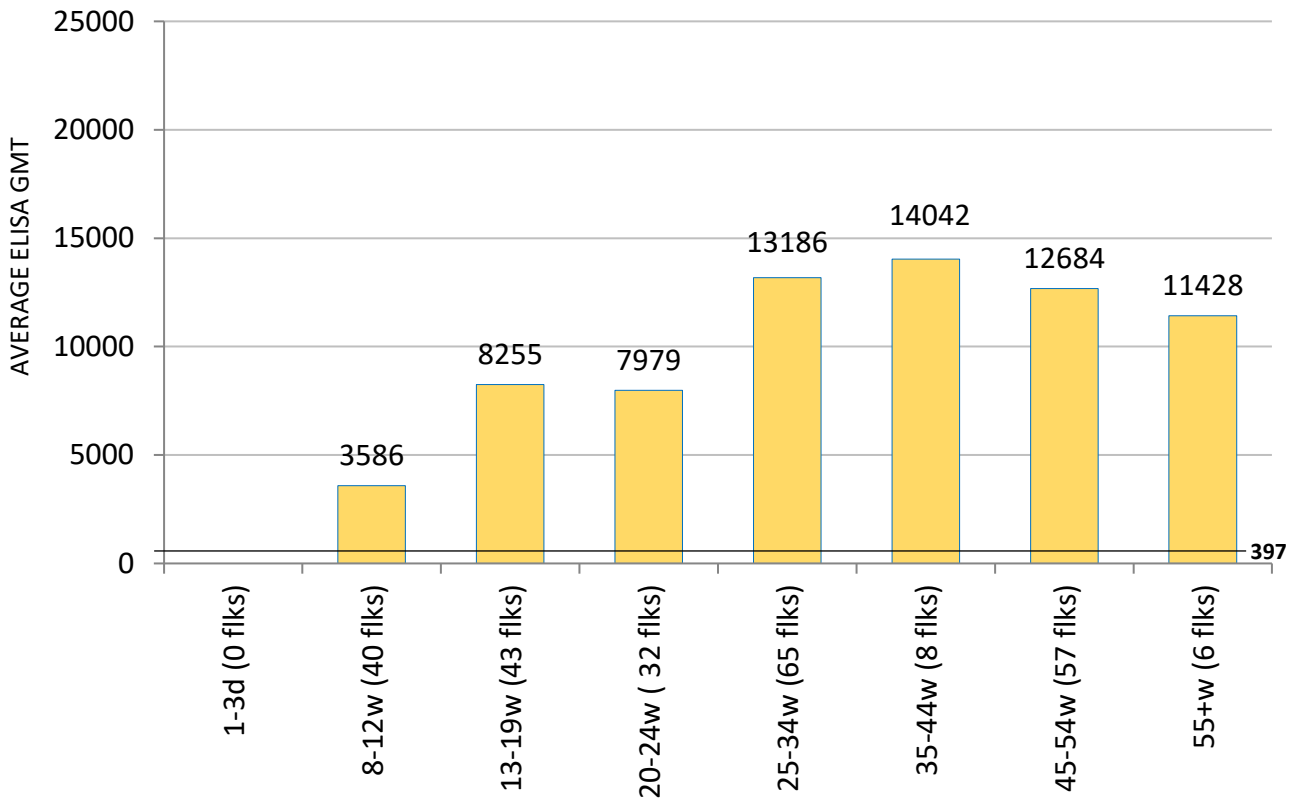
Breeder IBV titers and CVs by age

Complexes Vaccinating with the L-LP programs



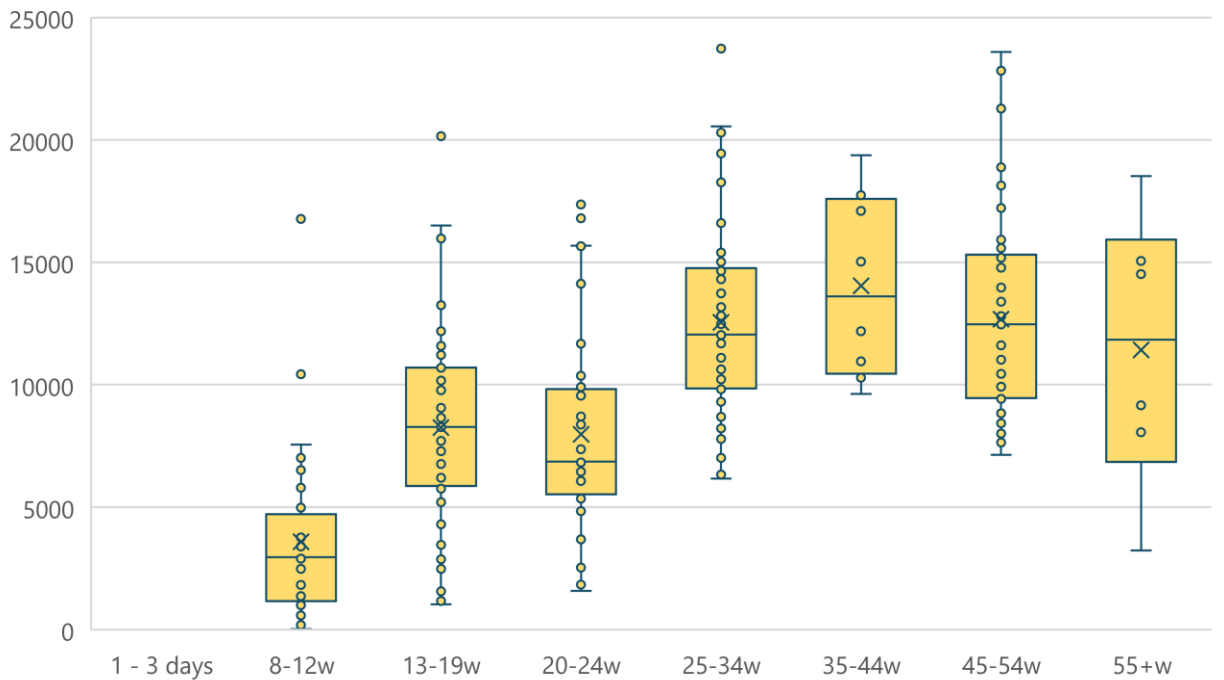
Breeder IBV titers and CVs by age

Complexes Vaccinating with the L-K programs

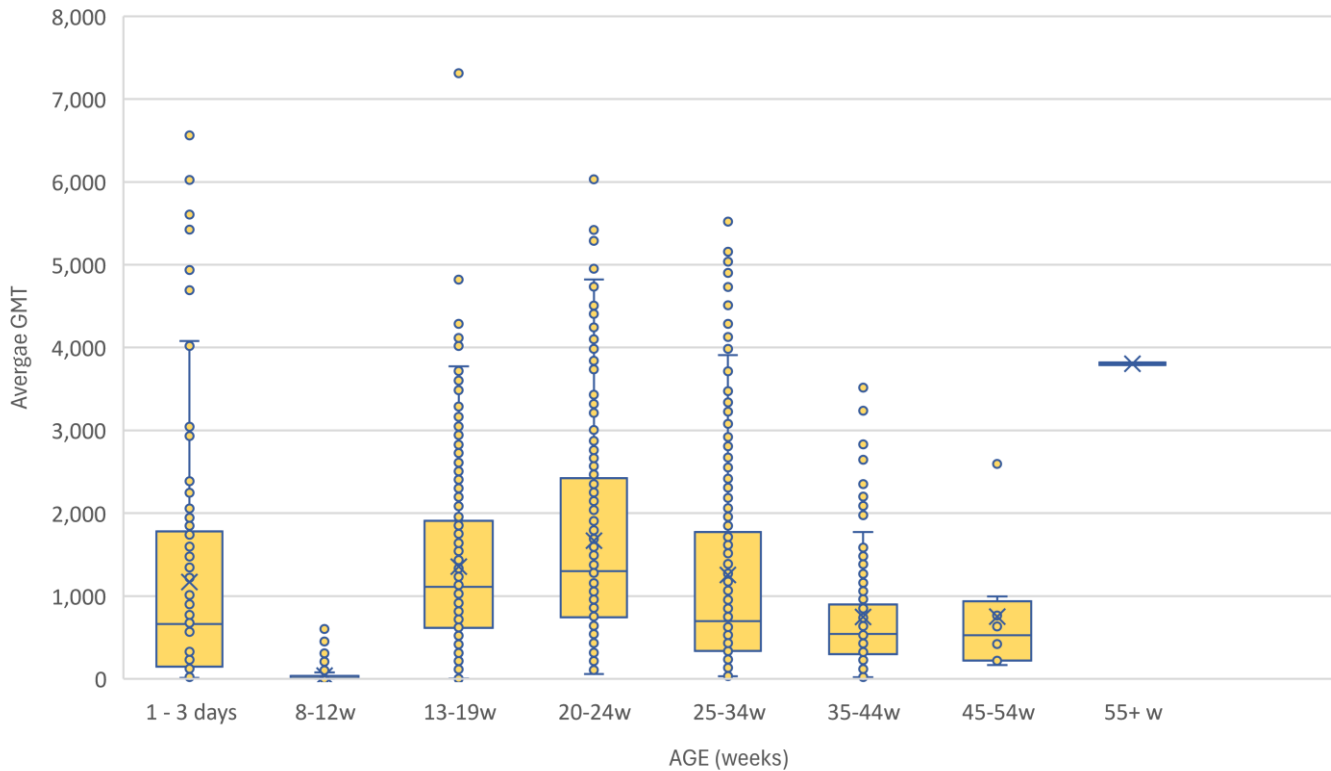
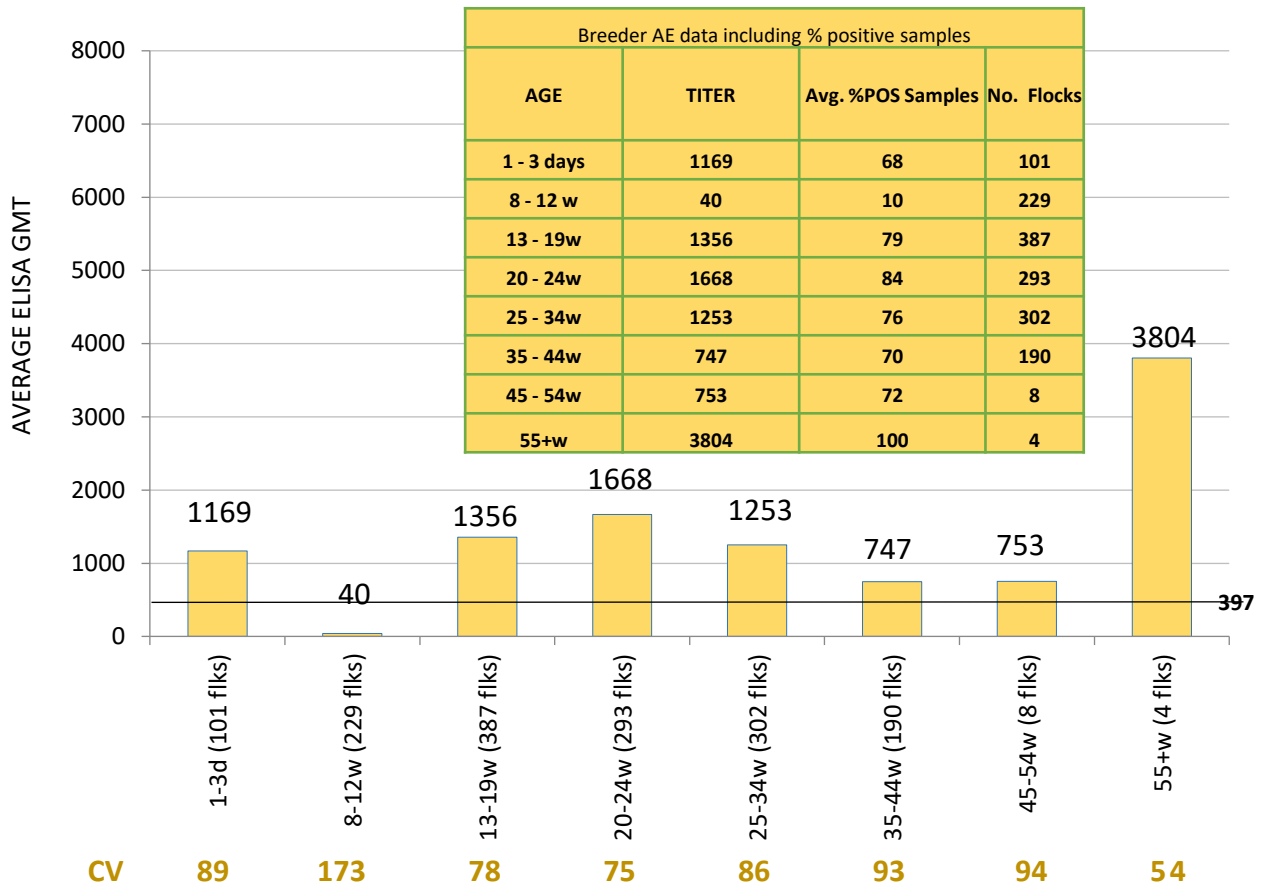


CV

81 48 48 21 20 25 35



Breeder AE titers and CVs by age



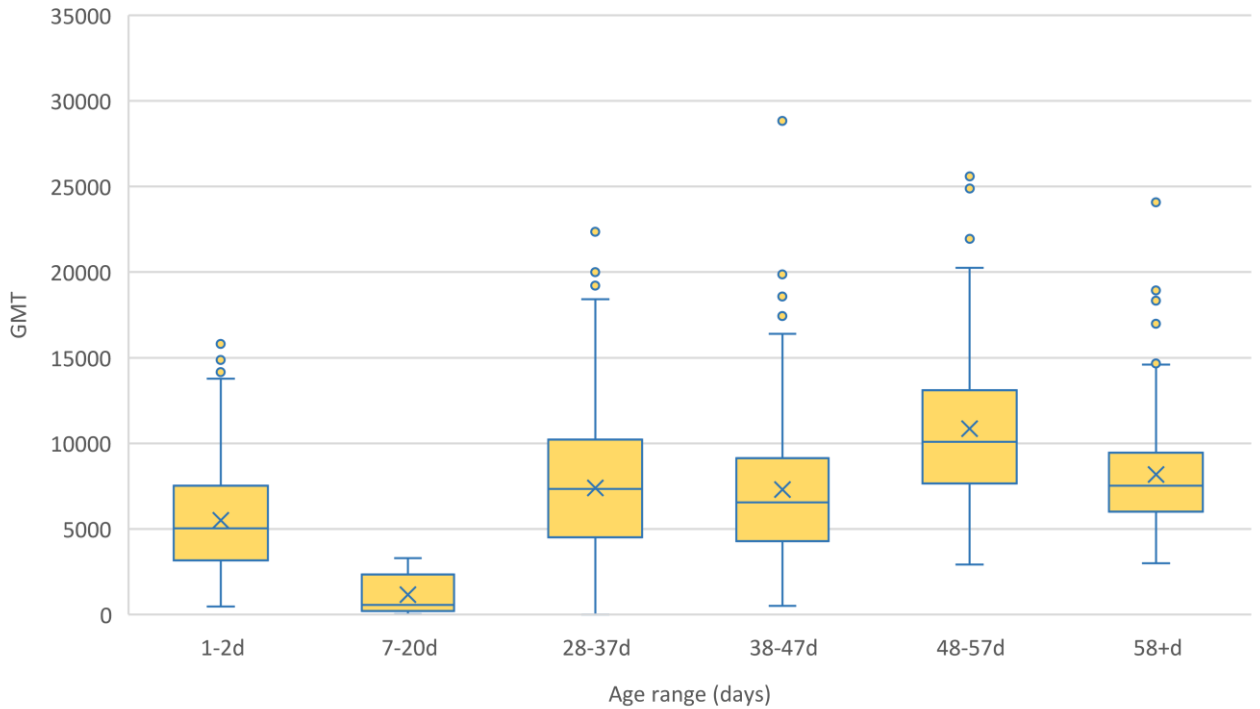
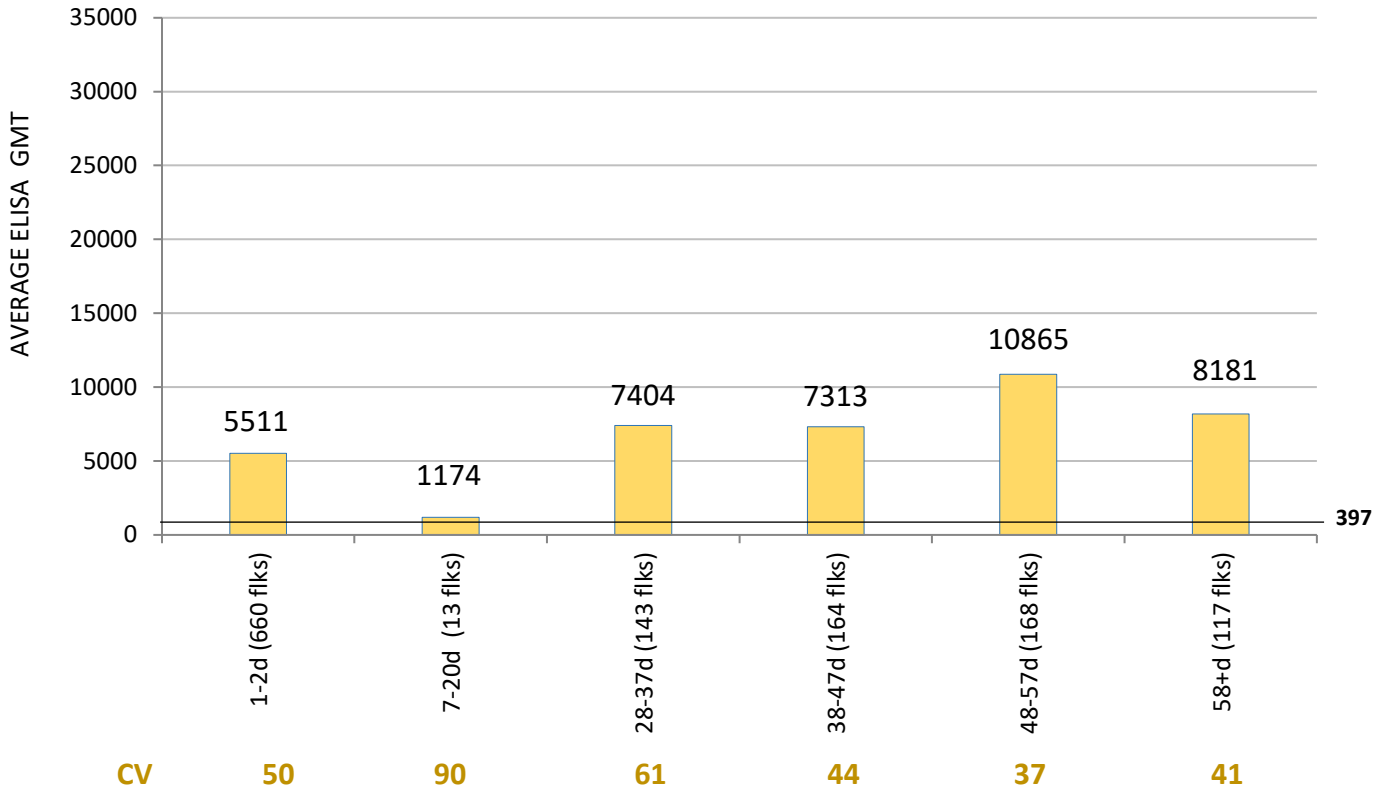
Breeder **CAV** % positive and CVs by age

| AGE | Avg % positive samples | CV | No. of flocks |
|---------------|-------------------------------|-----------|----------------------|
| 1-3d | 97.7 | 84 | 189 |
| 8-12w | 99.5 | 87 | 355 |
| 13-19w | 99.0 | 66 | 935 |
| 20-24w | 99.4 | 62 | 294 |
| 25-34w | 99.3 | 67 | 359 |
| 35-44w | 99.3 | 69 | 196 |
| 45-54w | 99.2 | 65 | 53 |
| 55+w | 99.3 | 64 | 8 |

ELISA Titers in Broilers

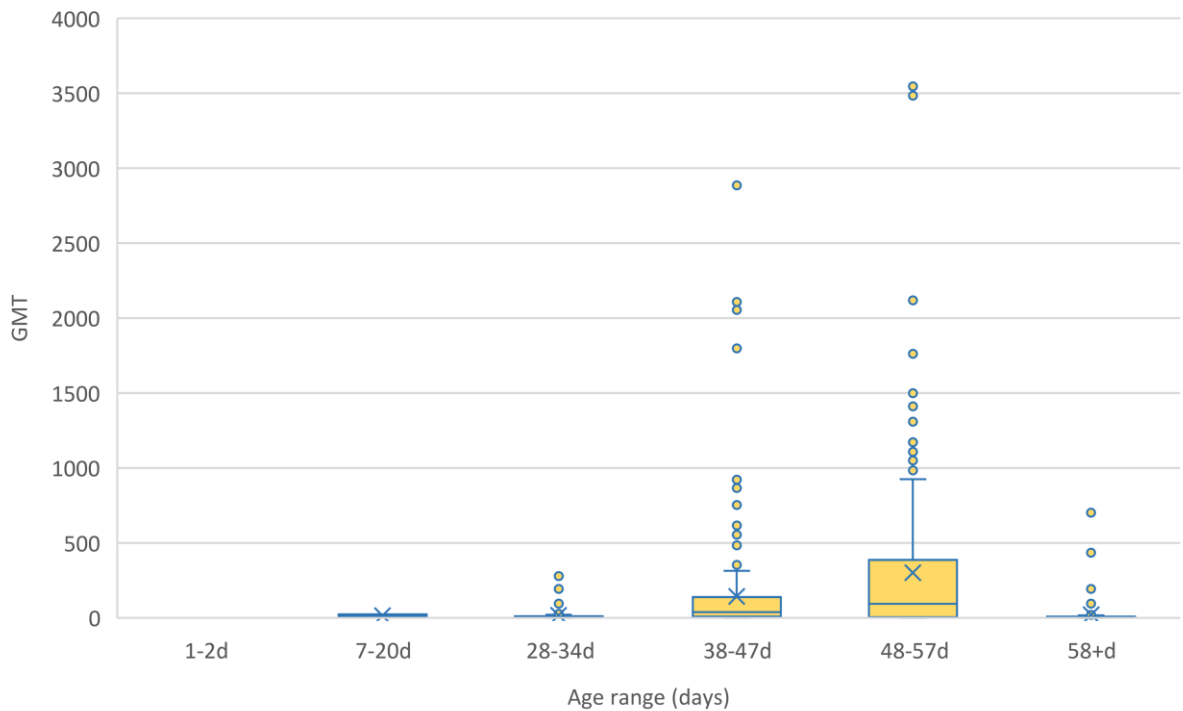
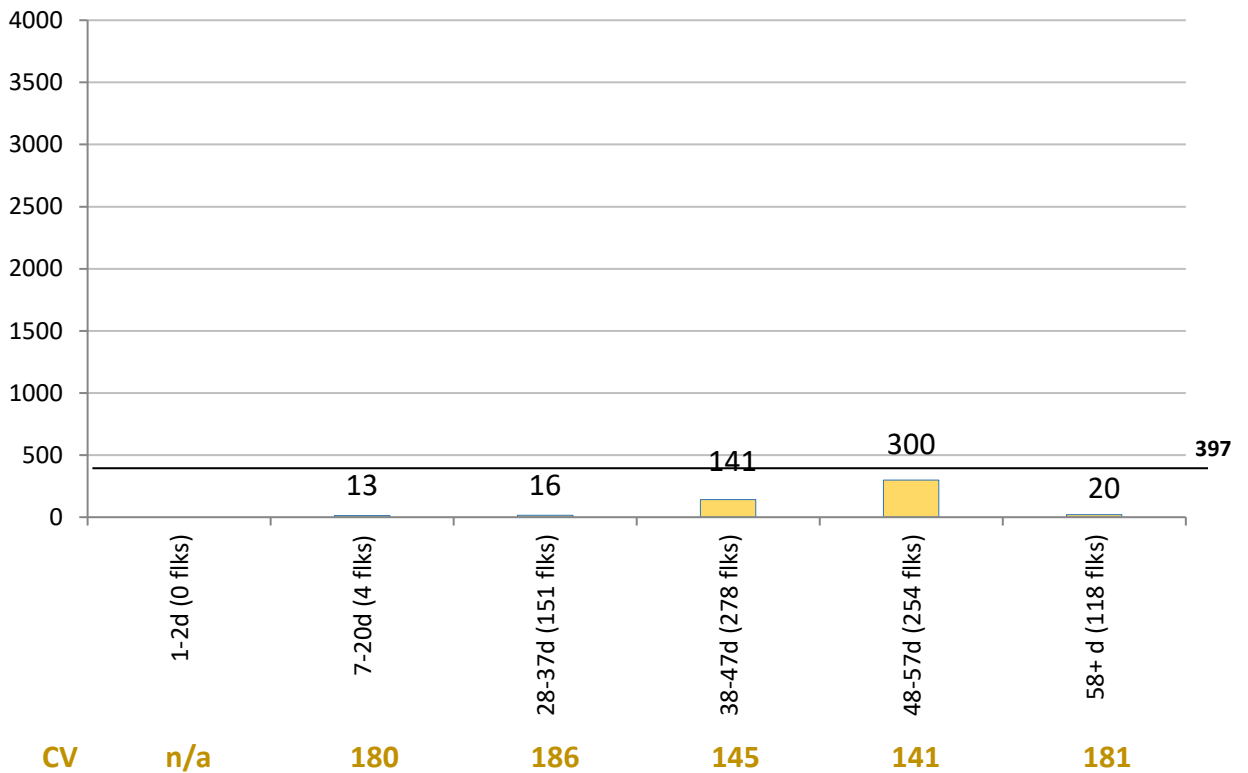
- Age ranges are divided in 6 groups: 1-2 days, 7-20 days, 28-37 days, 38-47 days, 48-57 days and 58+ days.
- GPLN receives very few broiler samples between 7 and 27 days of age. This age range reflects the maternal antibody decline after hatching.
- After 27 days of age, the increase in titers is due 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



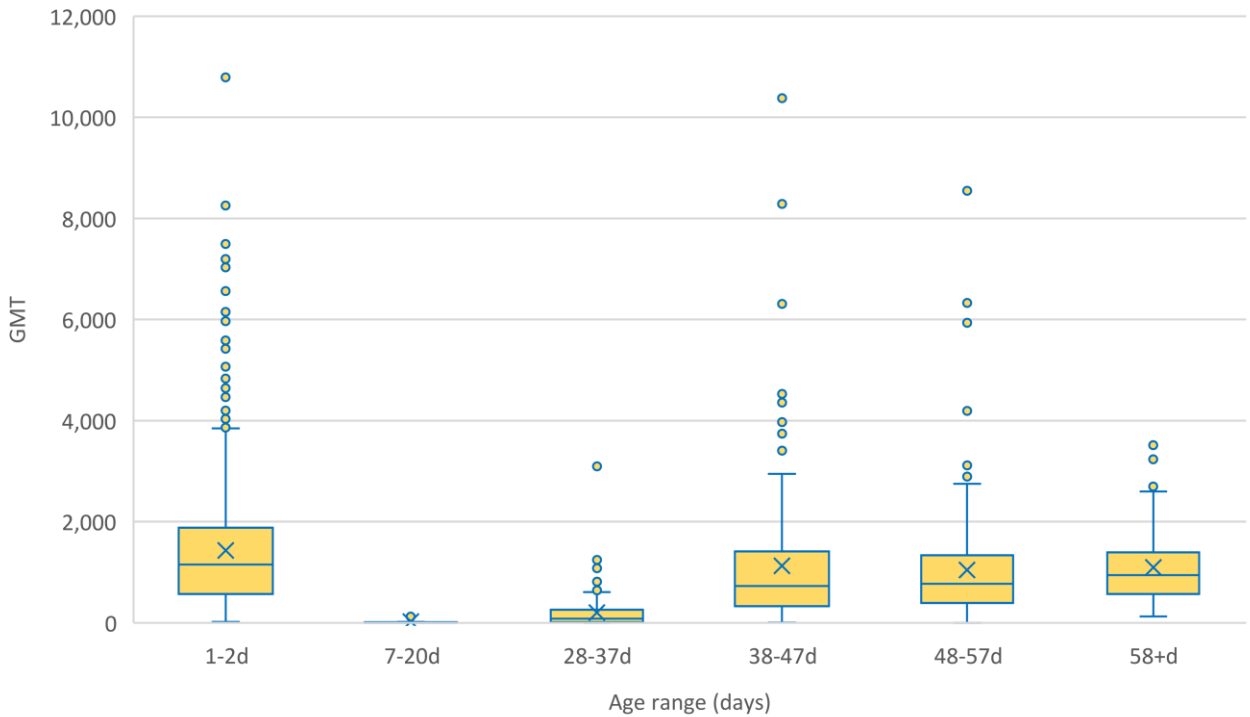
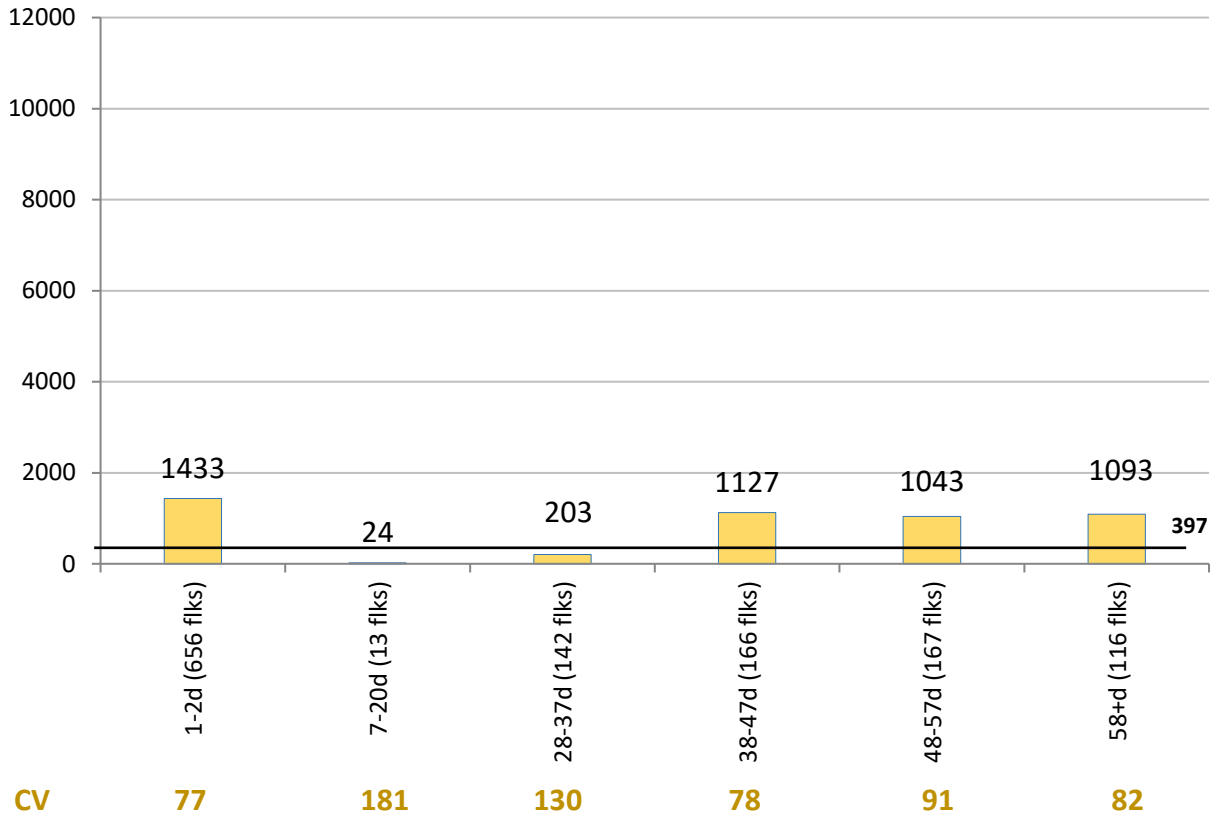
Broiler NDV titers and CVs by age

AVERAGE ELISA GMT

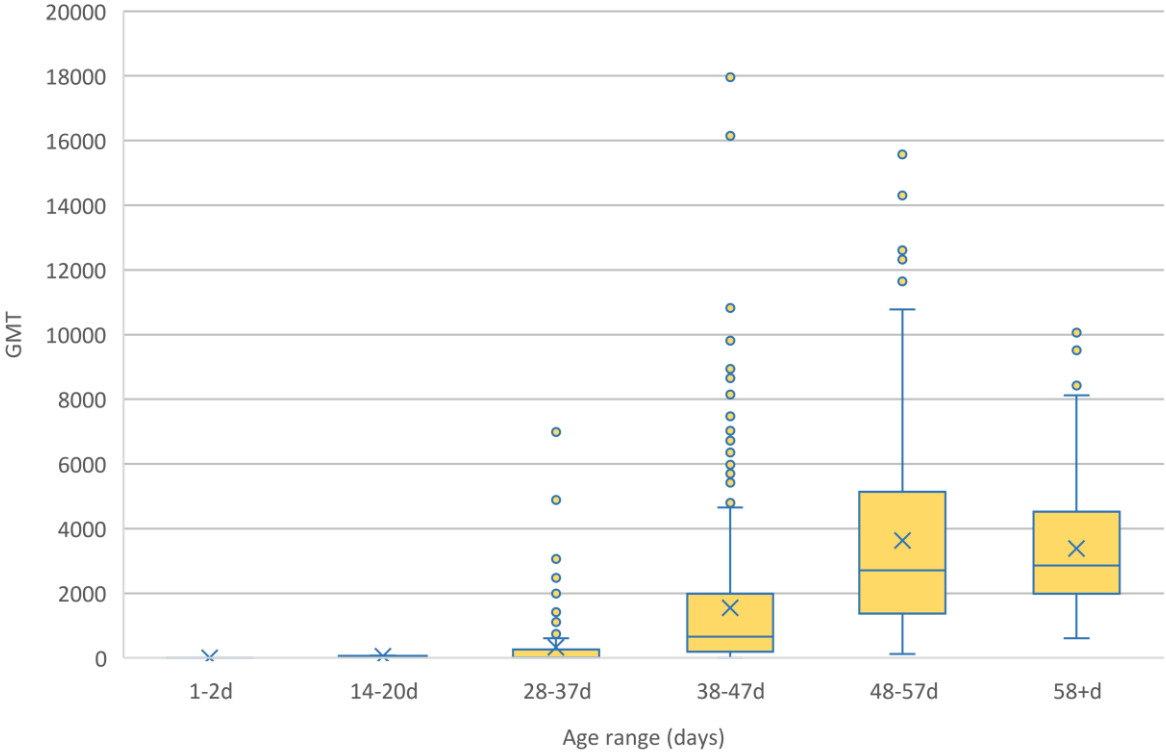
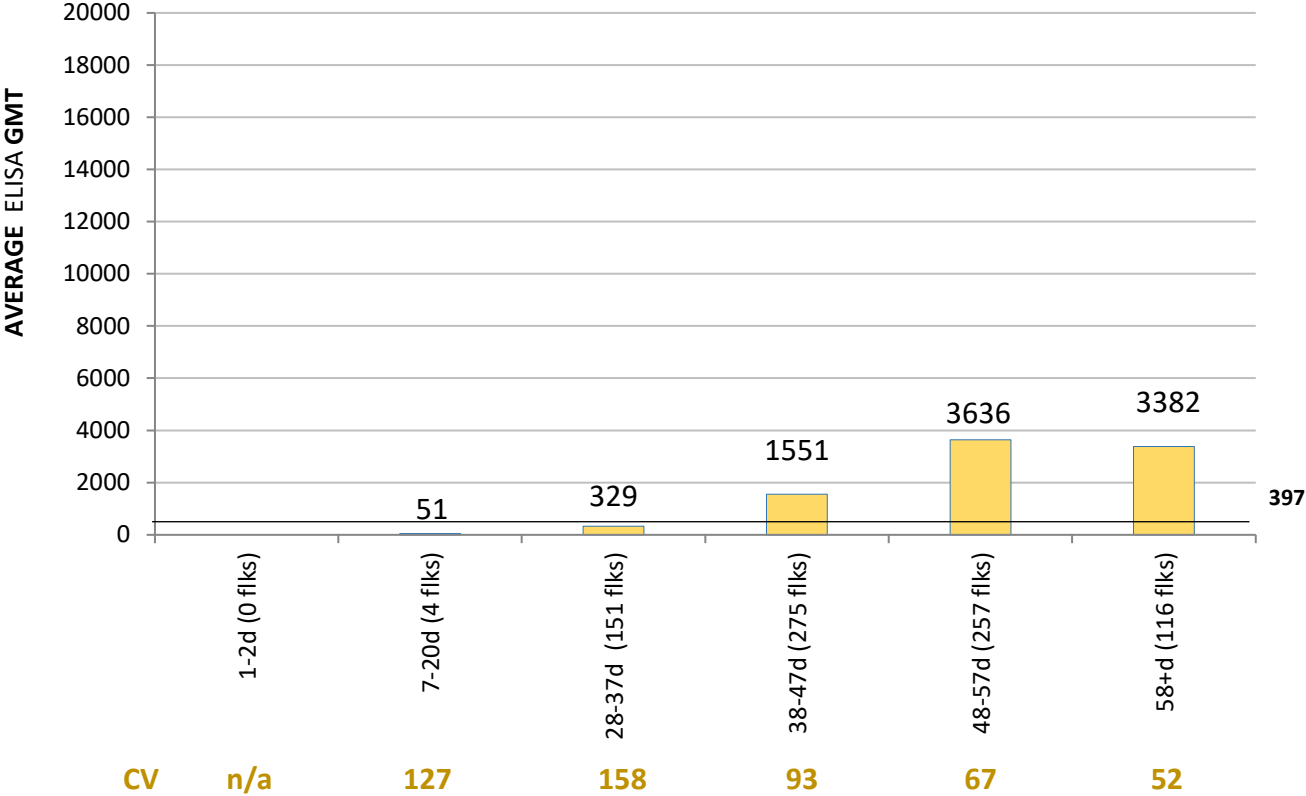


Broiler REO titers and CVs by age

AVERAGE ELISA GMT



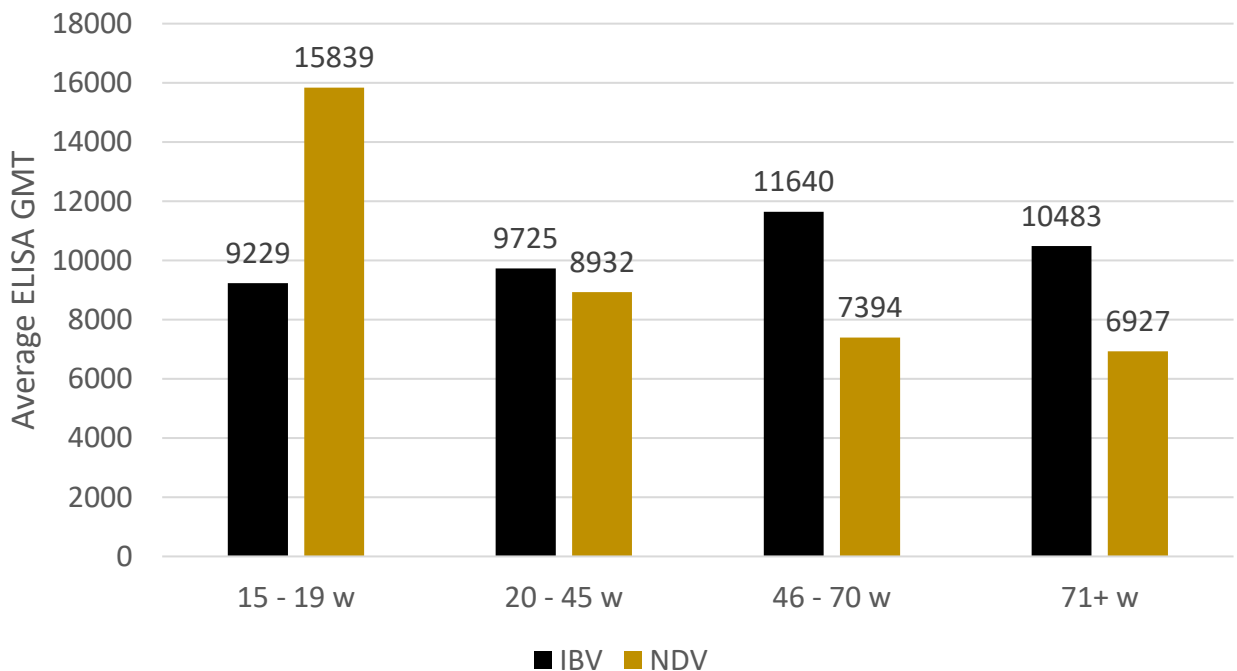
Broiler IBV titers and CVs by age



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 or Georgia commercial layer pullet flocks.
- The number of samples per flock in this series is 10 or greater.

Layer IBV & NDV titers and CVs by age



| | 15 - 19 w | 20 - 45 w | 46 - 70 w | 71+ w |
|-----------|-----------|-----------|-----------|-------|
| No flocks | 2 | 50 | 29 | 32 |
| CV | 31 | 38 | 30 | 32 |
| | 1 | 40 | 28 | 10 |
| | 12 | 39 | 37 | 40 |

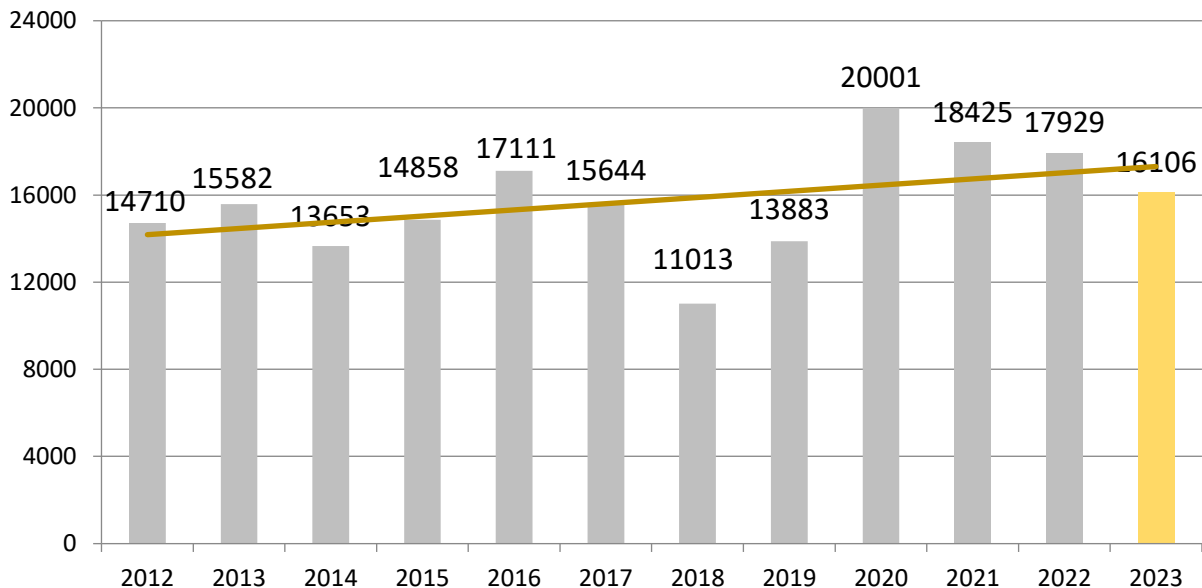
Trending of ELISA Titers over Time

The following 5 graphs show trends over time (2012-2022) for targeted agents and age ranges. A red trend line has been added to each graph.

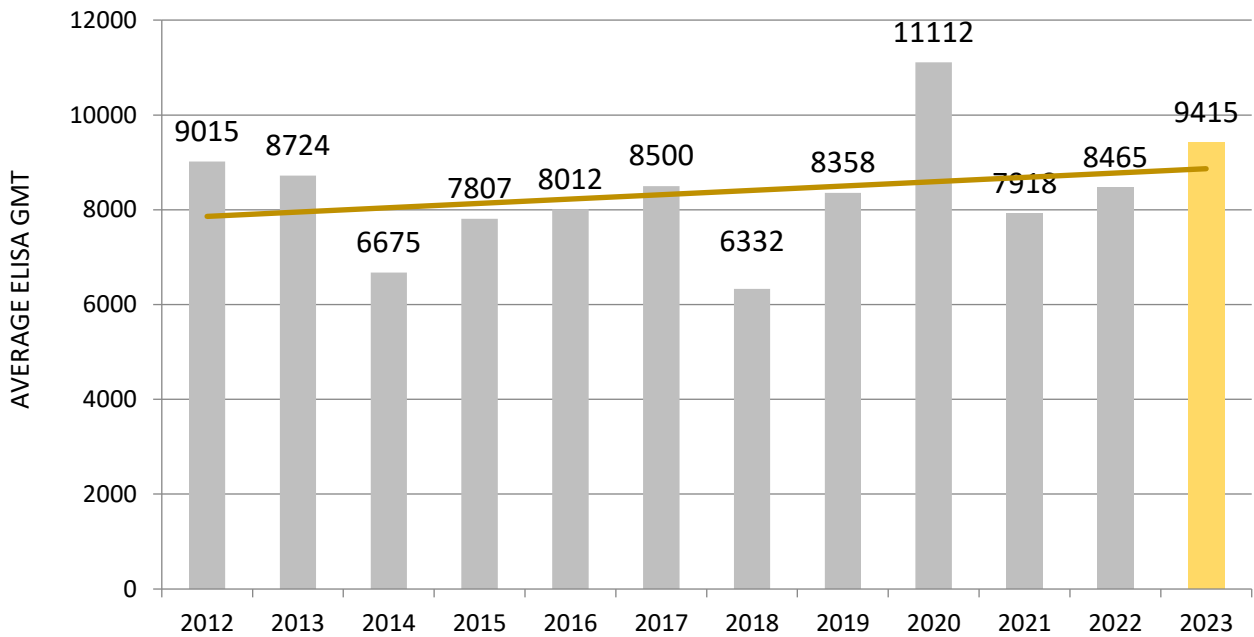
- Breeder IBD-XR titers at 22-26 weeks of age should be at their maximum. For that reason, this is a very popular age range for testing. Different vaccines are more immunogenic than others, and vaccination programs change over time, so that data point is interesting to compare year to year.
- Breeder 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

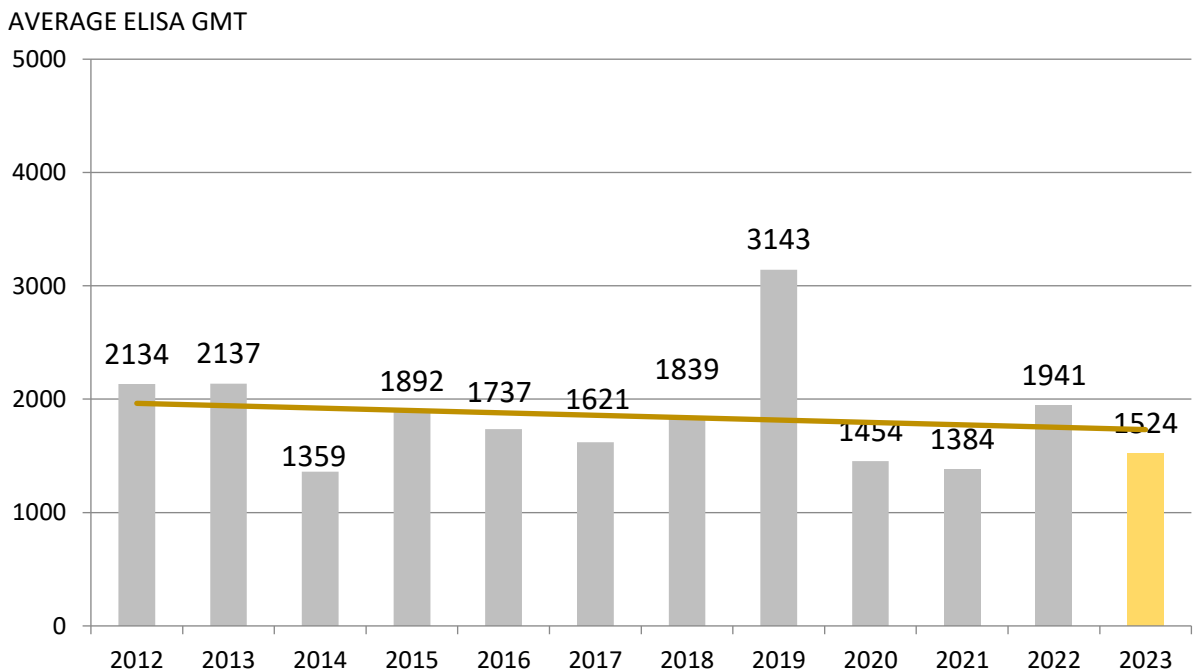
AVERAGE ELISA GMT



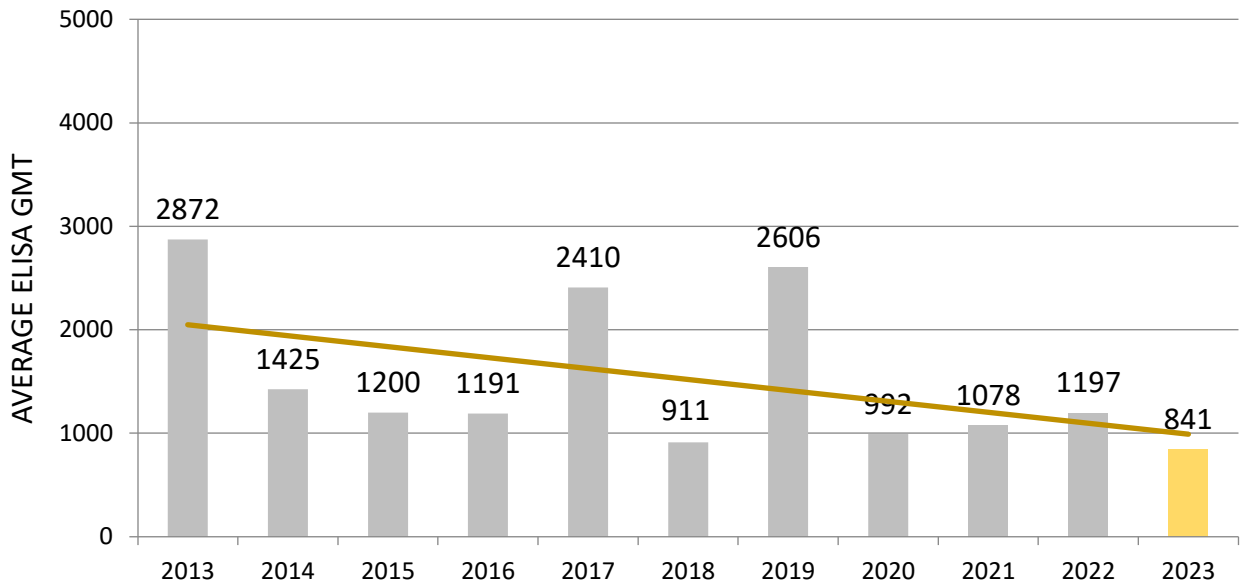
GA 22-26w **REO** titers in Breeders over time



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

AVERAGE ELISA GMT

