MAY 24

GLOBAL PROTECTION SERVICE

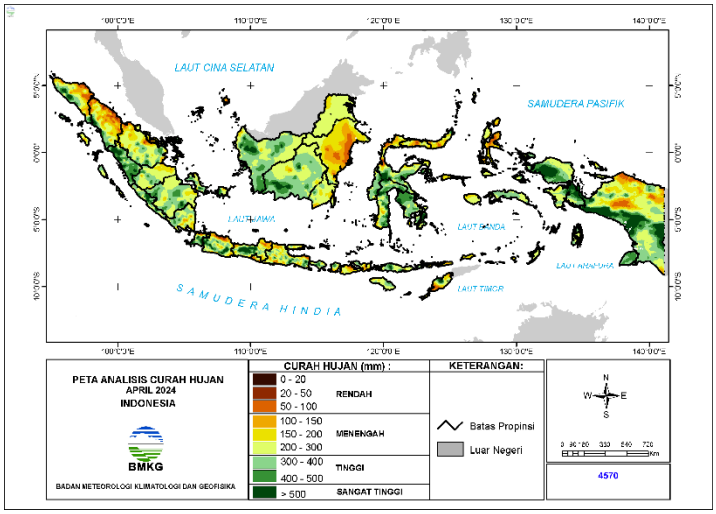
DISEASE SURVEILLANCE REPORT
Ceva Animal Health Indonesia

Eight Most Reported Poultry Diseases in April 2024

by Ismail Kurnia Rambe – Veterinary Service Coordinator

Monitoring diseases program have been carried out in the centres of poultry farming areas in two major islands in Indonesia, Sumatra and Java. Data collection was carried out by a team of veterinarians from Ceva Animal Health Indonesia in their responsibility areas. The diagnose was based on clinical symptoms and post-mortem analysis of the affected flocks. Laboratory tests for confirmation were carried out whenever necessary and possible.

The BMKG data analysis for April 2024 showed, the average relative humidity (RH) in the atmosphere generally ranges between 63 - 72%. The average surface temperature range between 24 - 28°C. Rainfall analysis for the month were low - medium criteria (0-150 mm). 8% of Indonesia's territoriy were entered to dry season. Detail of this weather report can be access in https://www.bmkg.go.id.



Providing comfortable environment and fresh air exchanges inside farm houses becoming a tough challenge for farmers

during extreme changing season. Failure of rearing management to anticipate the weather changes can cause the emergence of various diseases in poultry houses. In April 2024, there were total of 58 cases reported from 19 different diseases or condition – broilers reported 23 cases while layers reported 35 cases. Eight most prominent diseases will be explained further based on the area of occurrence. From the highest, those eight diseases are Heatstress with 7 reports or 12% of the total reports, followed by Chronic Respiratory Disease with 6 reports (10%), Avian Influenza H9, Infectious Bursal Disease, Coccidiosis, Necrotic Enteritis and Complicated Chronic Respiratory Disease each with 5 reports (9%) and Infectious Bronchitis with 4 reports (7%). Other diseases were Newcastle Disease with 3 cases (5%), Infectious Coryza, Helminthiasis and Infectious Laryngotracheitis each with 2 cases (3%). And the rest of the reports are Avian Influenza H5, Mismanagement, Feed Quality, Neonatal coli, Inclusion Body Hepatitis, Aspergillosis, and Slowgrowth each with 1 case (2%) consecutively.

HEATSTRESS

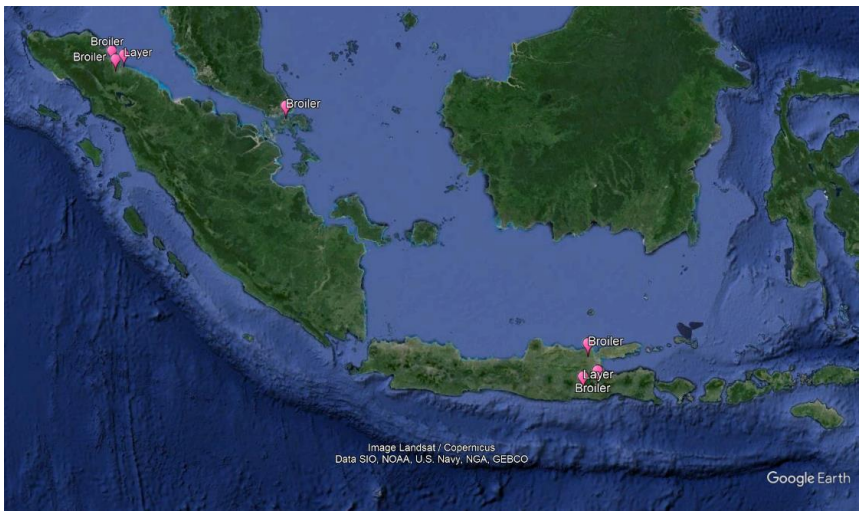
Since February 2024, BMKG analysis have been mentioned that the average temperature on the archipelago reached the highest in the same months ever since 1981 with 27,4°C. An increase of temperature as +0,9°C compared to usual situation. With the extreme weather condition together with managemental failure to overcome the high humidity, it was not surprising that Heatstress reports came as the first most reported disease/ syndrome in April 2024. There were 7 cases of Heatstress (12% of total reports), 5 cases from broilers and 2 cases from layers. Areas with Heatstress can be seen in Table and figure 1.

Areas	Species	No of Cases
Tanjung Pura, North Sumatera	Broiler	1
Sei Mencirim, North Sumatera	Broiler	1
Pantai Labu, North Sumatera	Layer	1
Batam, Riau Islands	Broiler	1
Malang, East Java	Broiler	1
Lamongan, East Java	Broiler	1
Blitar, East Java	Layer	1

Birds are 'heat stressed' if they have difficulty achieving a balance between body heat production and body heat loss. The temperature felt by the bird is all the higher since relative humidity increases. Excessive humidity inside the building reduces the insulating value of feathers, contributes to litter deterioration and increases microbial and parasitic hazards. On the contrary, lower relative humidity increases the risks of dust-related respiratory disease. This can occur at all ages and in all types of poultry. In the 'thermoneutral zone', birds can lose heat at a controlled rate using normal behaviour. There is no heat stress and body temperature is held constant. When conditions mean the 'upper critical temperature' is exceeded, birds must lose heat actively by panting. Panting is a normal response to heat and is not initially considered a welfare problem.

But as temperatures increase, the rate of panting increases. If heat production becomes greater than 'maximum heat loss' either in intensity (acute heat stress) or over long periods (chronic heat stress), birds may die. The body temperature of the broiler must remain very close to 41^0C (106^0F). If body temperature rises more than 4^0C above this, the bird will die.

To help birds releaving the heat, there are some measurements need to be corrected, such as cooling the temperature felt by the animals (ventilation, mist spraying, etc), adapting diet and drinking water supplies, and correcting physiological imbalances (rehydrating, compensating for feed underintake, fighting against stress consequences, supporting liver and kidney function).



CRD

As the extreme changing season still dominates most of Indonesia's equatorial region, the emergence of respiratory disease also dominates disease reports in poultry. Chronic Respiratory Disease is closely related to the failure of ventilation management to prevent the negative effects of extreme weather. In April 2024 there were 6 cases or 10% of Chronic Respiratory Diseases – 2 reports from broilers and 4 reports from layers. Areas of infection can be seen in Figure and Table 2.

Areas	Species	No of Cases
Lampung Timur, Lampung	Broiler	1
Purwakarta, West Java	Layer	1
Tangerang, Banten	Layer	1
Cianjur, West Java	Layer	1
Karanganyar, Central Java	Layer	1
Sukorejo, Central Java	Broiler	1

Many mycoplasma species can infect birds, but only Mycoplasma gallisepticum (MG), M. synoviae (MS), M. meleagridis (MM) and M. iowae (MI) are considered pathogenic in chickens and turkeys, and can cause economic losses due to stunted growth, condemnations associated with lesions, or synovitis, airsacculitis, decreased egg production, and decreased hatchability. Worldwide, the incidence of mycoplasma infection is favored by the intensification of poultry production.

Chronic Respiratory Disease (CRD) caused by Mycoplasma gallisepticum. The infection often complicated with viruses (Newcastle disease, coronavirus, metapneumovirus, etc.) or bacteria (Escherichia coli, Haemophilus spp., Pasteurella spp., Ornithobacterium rhinotracheale, other Mycoplasma sp, etc.) or with fungi (Aspergillus, etc.). Pathogenecity of the disease can be exacerbated by poor environmental conditions (high ammonia, dust, moisture, faulty ventilation, etc.), stress factors (social stress, handling, vaccination, selection, beak trimming, etc.). On farms, the most frequent mode of infection for MG or MS is the respiratory route.

Transmission occurs primarily by direct contact between sick or latent carriers and susceptible birds. Indirect transmission through human activity, wild birds or insects or lives tock equipment is also possible. In addition, MG and MS can be transmitted vertically through the egg, either by contamination of the embryo by blood route, or because of contiguity between the oviduct and the infected air sacs. The

percentage of infected eggs remains limited but probably allows the spread of infection in the hatchery and then the farms. The rate of vertical transmission would be greater in the first weeks of infection.



AI H9

The next place for the most reported disease in April 2024 was held by Avian Influenza subtype H9 infection. AI H9 was reported 5 times, all reports were from layers, this number equal to 9% of the total reports. The area affected by AI H9 is shown in Figure and Table 3.

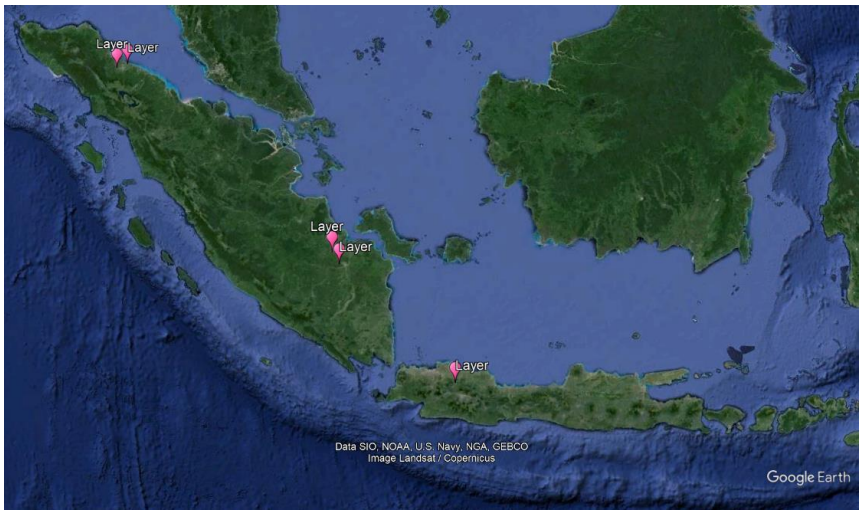
Areas	Species	No of Cases
Binjai, North Sumatera	Layer	1
Pantai Labu, North Sumatera	Layer	1
Banyuasin, South Sumatera	Layer	2
Purwakarta, West Java	Layer	1

Avian Influenza infection in poultry, primarily chickens, can cause clinical disease or losses in production for the affected flocks. The virus can be generally divided into viruses that cause a localized infection, often primarily restricted to the respiratory or enteric tract, and viruses that cause systemic infections. The viruses that cause localized infections are usually referred to as low pathogenic avian influenza (LPAI) viruses, and typically these viruses do not cause high mortality in affected flocks.

In general for LPAI viruses the disease symptoms are restricted to the respiratory and enteric tract and can include lesions in the sinuses, trachea, bronchi, lungs, airsacs, and intestines. Lesions can include mucopurulent or caseous inflammation, thickening of airsacs, edema of the serosa and other localized lesions. Evidence of enteritis may also be seen with some strains of virus. Internal lesions are rare but can include peritonitis, pancreatitis, lesions in the reproductive tract, and in the kidney. Decreases in egg production without other clinical signs are common in layers or breeders in production.

The influenza reservoir, is in wild birds including ducks, gulls and shorebirds. All 16 HA and 9 NA subtypes of viral genes are found in wild birds, with certain types of ducks, like pintails and mallards, having the highest prevalence of infection.

The LPAI viruses can be of many different hemagglutinin and neuraminidase subtypes. H9 is a LPAI virus. It is only a rare occurrence that these low pathogenic viruses mutate into the highly pathogenic forms of the virus.



IBD

The next pathogen in the list of threats as of April 2024 is Infectious Bursal Disease so called Gumboro disease. There were 5 reports or 9%, 2 reports from broilers and 3 from layers. Areas with IBD reports can be seen in Table and Figure 4.

Areas	Species	No of Cases
Pantai Labu, North Sumatera	Layer	1
Bogor, West Java	Broiler	1
Sukabumi, West Java	Broiler	1
Ciamis, West Java	Layer	1
Blitar, East Java	Layer	1

According to Ceva Indonesia GPS Disease Surveillance database analysis, Infectious bursal disease (IBD, Gumboro) infection mostly reported in the rainy and fluctuated season. Various factors related to this season, such as prolonged cold, high humidity, poor environment quality, as well as the fungal contamination of feed raw materials, the presence of vector animals carrying the IBD virus from one period to another, will increase the risk of IBD infection in the field. The increase virus loads can only be suppressed by implementing a strict, assertive and sustainable biosecurity program. If the biosecurity program is underestimated and fails, a large number of vvIBD virus will precede the work of the attenuated live vaccine virus. Likewise, immunosuppressive diseases such as mycotoxicosis, CIAV, Coccidiosis in early age may damage the immune system thus lead to IBD vaccination failure.

Another important issue in the protection of IBD is the heterogeneity of IBD maternal antibody in day-old chicks. The wide variety of IBD MAB makes it difficult to determine the day of vaccination and some birds may be unvaccinated at the right time. The key to prevent repeated IBD infection is the ability of IBD vaccine to completely occupate Bursa of Fabricius that will prevent the next infection by any IBD virus, able to adapt the decreasing MAB of IBD at any level, thus, able to Stop Gumboro Cycle. Transmune have been proven its consistency to protect broilers and Novamune have been develop distinctively for layer

to protect Bursa against the field IBD virus of any kind. Both vaccines were vaccinated in the hatchery in under the close supervision of the Ceva Vaccination Service and Equipment team.



COCCIDIOSIS

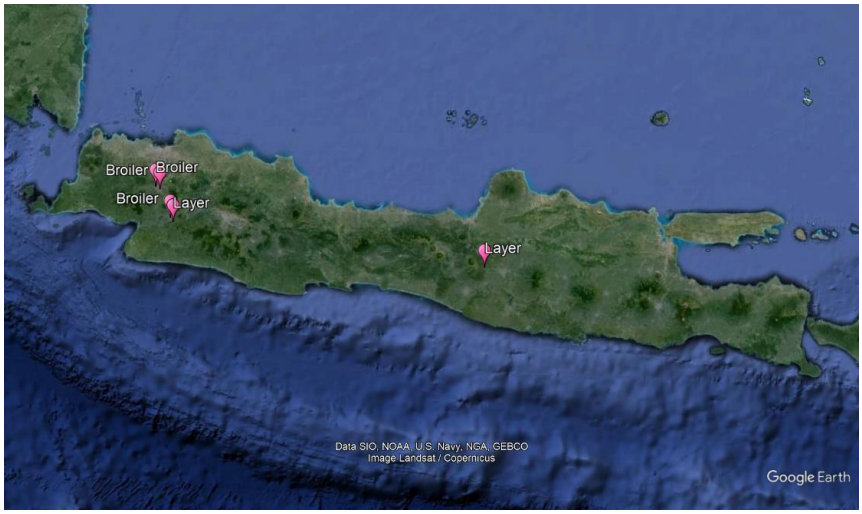
In April 2024, Coccidiosis came as the fifth highest reported diseases with 5 cases or equal to 9% of the total reports - 3 cases from broilers and 2 case from layers. Figure and Table 5 shown were Coccidiosis have been reported.

Areas	Species	No of Cases
Sukabumi, West Java	Layer	1
Sukabumi, West Java	Broiler	1
Bogor, West Java	Broiler	2
Boyolali, Central Java	Layer	1

Coccidiosis is caused by various Eimeria species affecting mostly the digestive tract of poultry. With a global distribution of these parasites, the economical impact for this disease is estimated at over US$ 1 billion, due to production and animal losses as well as the cost of the widespread usage of prophylactic medications and vaccines. Due to the characteristics of the parasites and the management conditions in poultry production, the eradication of coccidiosis is not possible. With the ever increasing cost of developing new molecules and the pressure to use less medication in foodproducing animals, the control of cocciodiosis must rely on the current prophylactic methods combined with proper flock management.

The parasites responsible for coccidiosis in poultry belong to the family of the *Eimeriidae*, all obligate intracellular parasitic protozoa. The structure of the sporulated oocyst allows for the distinction between *Eimeria spp*. and other parasites like *Cryptosporidium spp*. Eimeria sporulated oocysts contain 4 sporocysts and each sporocyst 2 sporozoites. *Eimeria spp*. are extremely species specific for their host, with some species affecting only chickens, other only turkeys or guinea fowl. A number of species have been identified in chickens (7), turkeys (5), quail (1), guinea fowl (2), geese (4), pigeons (2) and pheasants (4).

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NE

Clostridium perfringens type A or C, a toxin-producing, anaerobic, gram-positive, spore-forming rod is commonly found in soil and fresh water, and in the intestines and feces of normal birds, so NE is not considered a contagious disease *per se*. They become a problem when the balance of gut microflora is disrupted. Factors that cause disruption of the microflora can be humidity, litter quality, feed problem, etc. The infection mostly related to poor oxygenation inside the houses.

Areas	Species	No of Cases
Lampung Timur, Lampung	Broiler	1
Majalengka, West Java	Broiler	1
Sukorejo, Central Java	Broiler	1
Batang, Central Java	Layer	1
Salatiga, Central Java	Layer	1

Not surprisingly, as earlier stated by BMKG, April 2024 is the month with >70% relative humidity (RH) in the atmosphere and the average surface temperature ranges from 24 - 28°C. This weather condition somehow is favor *Clostridium perfringens* to replicate more in the poultry digestive tract, thus lead to Necrotic Enteritis case. With the April weather, NE becoming the sixth highest reported cases with 5 reports or 9% - 3 cases from broilers and 2 case from layers. Areas with NE infection can be seen in Table and figure 6.

Necrotic enteritis is principally a disease of young broiler chickens between 2 and 5 weeks of age, raised on litter. It has also been reported in layers both on litter and in cages, and in turkeys. Morbidity and mortality can be quite high. A subclinical form of NE produces few clinical signs and little or no mortality, but results in performance shortfalls. The lesions in this form consist of 1 to 2 mm circular depressions in the mucosa surrounded by a hyperemic periphery, and covered with adherent irregular, yellow necrotic material.

Removal of fishmeal, replacement of viscous cereals with corn (maize), and increases in the grist size or use of whole grains may help decrease the incidence. Exogenous enzymes which break down the viscous polysaccharides in grains may have some benefit. A number of probiotics have shown beneficial effects in controlled challenge trials. Frequent cleaning and disinfection of facilities, the use of clean, deep litter, of organic acids in the feed or water, and acidifying the litter are other possible aids. Good control of coccidiosis is paramount.



CCRD

Complicated Chronic Respiratory Disease is a complicated condition mostly related to failure of rearing management in overcome the negative effects of the extreme weather. With the weather as previously described by BMKG, it is very likely to CCRD becoming the seventh reported cases in April 2024. Its came with a total of 5 reports or equal to 9% of total reports - 3 reports were from broilers and 2 from layers. CCRD reported areas can be seen in Figure and Table 7.

Areas	Species	No of Cases
Karawang, West Java	Broiler	1
Tangerang, Banten	Layer	1
Sukabumi, West Java	Layer	1
Bogor, West Java	Broiler	2

The term "complicated" in Complicated Chronic Respiratory Disease means that this disease caused by multiple factors, which includes non infectious factors like extreme weather, high humidity, poor water sanitation and poor ventilation management, or infectious factors such as virus (IB, ND, AI, ILT), bacterial (E. Coli, Mycoplasma sp) with E. Coli isolation as the most dominant bacteria. Primary agents (e.g., field a nd vaccine strains of infectious bronchitis virus and Newcastle disease virus, mycoplasmas, avian metapneumovirus in turkeys, dust, ammonia, etc.) injure the respiratory mucosa, allowing E. coli to enter the blood stream. There is airsacculitis of varying severity, and the lesion is usually of long duration.

This expression of the disease used to be called chronic respiratory disease or CRD when Mycoplasma gallisepticum was the initial insulting agent. Infected air sacs are thickened, opaque, and may contain caseous exudate. Other respiratory lesions include pneumonia (more frequent in turkeys), pleuritis (more frequent in chickens), and pleuropneumonia. In addition to airsacculitis and lung lesions, affected birds usually have peritonitis and other lesions consistent with bacterial septicemia. The success keys to solve CCRD problem is, determine the initial cause of the complex, if its related to management factors, do the

improvement, when it is related to viral infection such as IB or ND, improve the protection against the virus by vaccination and biosecurity efforts.



IB

Infectious Bronchitis continues to be one of the biggest threat for Indonesian poultry business. Case reports continuously increased in every area of surveillance. In April 2024, the avian coronavirus, again, marked its place as the eight highest infection reported with 4 cases, which equal to 7% of the total April reports. 1 report from broilers and 3 reports from layers. The areas affected by IB is shown in Table and Figure 8.

Areas	Species	No of Cases
Binjai, North Sumatera	Layer	1
Banyuasin, South Sumatera	Layer	1
Sukabumi, West Java	Broiler	1
Kediri, East Java	Layer	1

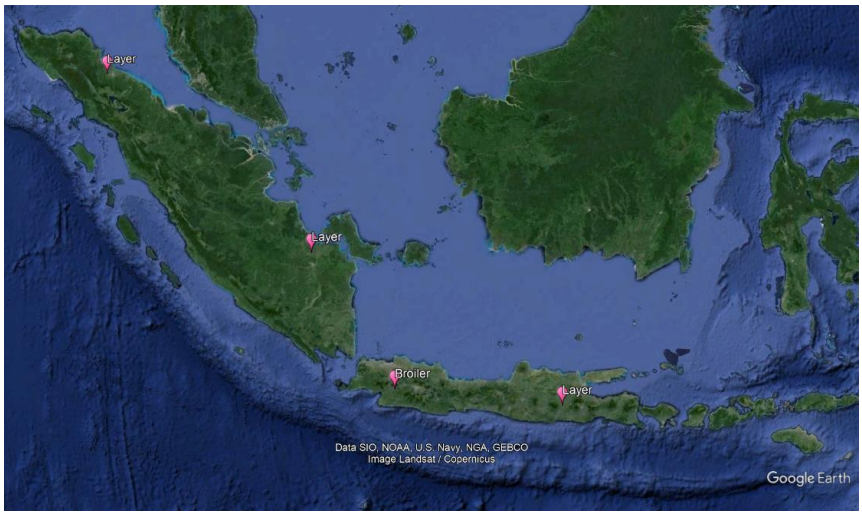
The ferocity of IB infections cause very severe performance disorders, both achievement of BW and FCR, high mortality (nephropatogenic strains), decreased of egg production, and high-cost of medications due to respiratory problems. IB infection have a tendency to complicate with respiratory viruses (ND, AI, ILT, etc.) and / or pathogenic bacteria (E. coli, Mycoplasma sp, Ornithobacterium sp). Because of its negative effect, in year 2017, Infectious Bronchitis have been stated as the biggest cause of economical losses in the poultry farming industry by Avian Health International.

IB is another disease that highly related to increasing humidity. With the average relative humidity (RH) that ranged very wide in the atmosphere, it is favor for avian coronavirus to cause problems in poultry. The presence of respiratory diseases in poultry farms could be caused by ineffective ventilation. Reduced ventilation usually results in an air pollutants, such as ammonia, carbon dioxide, dust and air-borne microorganisms.

The disease defined as a rapidly transmissible disease caused by avian coronaviruses, affecting the respiratory, urogenital, and intestinal tracts of hybrid layer, meat type, and fancy chickens of all age groups. Lateral spread of IBV may also affect quails, ring-necked pheasants, domestic turkeys and other gallinaceous birds. The airborne spread of IBV is the most common and most significant mode of transmission in areas with a dense chicken population. Long distance, even intercontinental, spread of

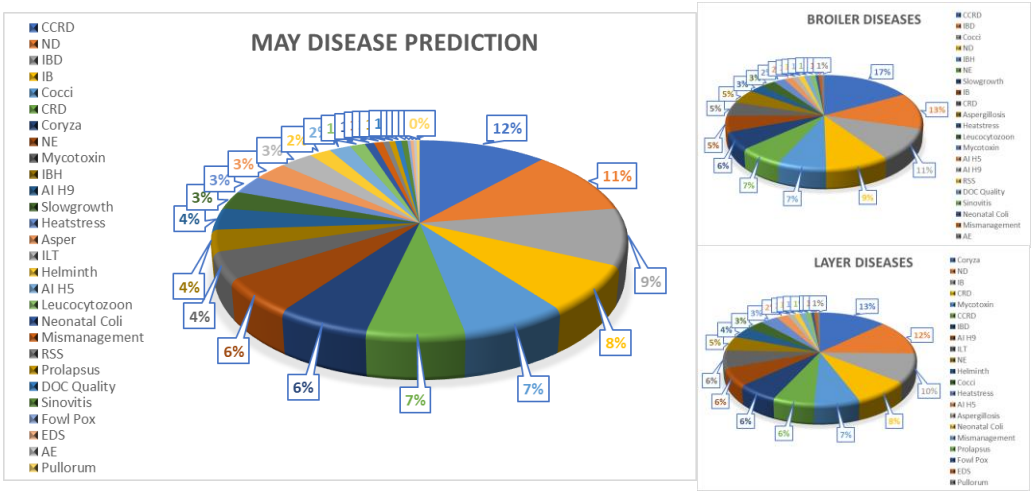
IBV is possible by trade in infected chicks, pullets, and adult chickens and also by contaminated eggs and multiple-use packing material.

Since infectious bronchitis virus have an ability to infect from DOC, it is highly recommended to provide protection through vaccination in the hatchery by combining a classical and a variant live IB vaccine that would provide a lifelong protection for broilers. As for layers, it is require to boosts both live and killed IB vaccines in pullets to laying period.



MAY 24 PREDICTION

Based on surveillance data for 6 consecutive years, we are able to predict the dominant disease occurring in a certain month. For the prediction of disease incidence in the next May 2024, the percentage of disease occurring in the same month during the previous 6 years is as follows.



The Indonesian poultry business will still facing multiple threats in May 2024. Especially when the extreme weather continuous. The three diseases with the highest probability are: CCRD 12%, ND 11%, and IBD 9% opportunity. The three highest predicted diseases in broilers are : CCRD 17%, IBD 13%, and Cocci 11% opportunity. While layers prediction are Coryza 13%, ND 12% and IB 10% probability. This prediction is intended to help the poultry community improve its prevention program, not as a guarantee of accuracy.

CONCLUSION

In April 2024, the GPS Diseases Surveillance program have been reporting 58 cases from 19 different diseases or condition – broilers reported 23 cases while layes reported 35 cases. From the highest, eight most prominent diseases are Heatstress with 7 reports or 12% of the total reports, followed by Chronic Respiratory Disease with 6 reports (10%), Avian Influenza H9, Infectious Bursal Disease, Coccidiosis, Necrotic Enteritis and Complicated Chronic Respiratory Disease each with 5 reports (9%) and Infectious Bronchitis with 4 reports (7%). Other diseases were Newcastle Disease with 3 cases (5%), Infectious Coryza, Helminthiasis and Infectious Laryngotracheitis each with 2 cases (3%). And the rest of the reports are Avian Influenza H5, Mismanagement, Feed Quality, Neonatal coli, Inclusion Body Hepatitis, Aspergillosis, and Slowgrowth each with 1 case (2%) consecutively. For more detail information of this report please contact Ceva Animal Health Representative in your area to help and provide solution to your poultry problems.