JUN 24

GLOBAL PROTECTION SERVICE

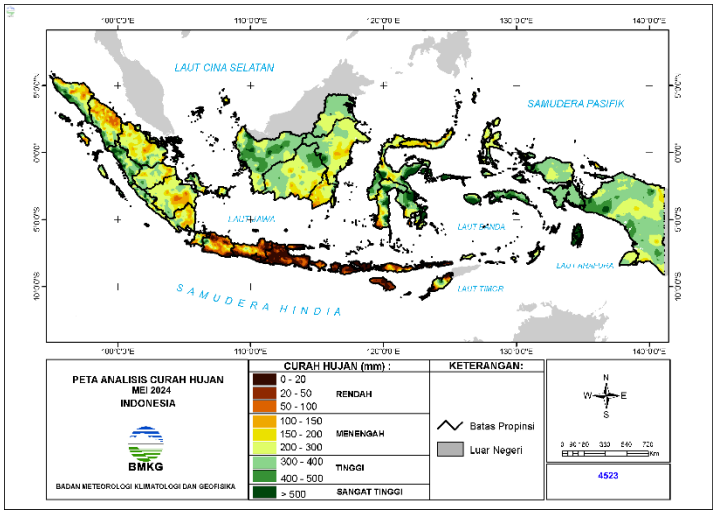
DISEASE SURVEILLANCE REPORT
Ceva Animal Health Indonesia

Seven Most Reported Poultry Diseases in May 2024

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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 May 2024 showed, the average relative humidity (RH) in the atmosphere generally ranges between 60 - 75%. The average surface temperature range between 23 - 29°C. Rainfall analysis for the month were varies, from low criteria (21%), medium (69%), and high – very high criterias (10%). 26% of Indonesia's territoriy were entered to dry season. Detail of this weather report can be access in https://www.bmkg.go.id.



To achieve the best genetic capabilities of a breed, a farmer needs to provide a

comfortable environment and fresh air exchange in the farmhouse. This goal becomes a tough challenge amidst extreme seasonal changes. Failure of rearing management to anticipate the weather changes can cause the emergence of various diseases in poultry houses. In May 2024, there were total of 72 cases reported from 21 different diseases or condition – broilers reported 29 cases while layers reported 43 cases. Seven most prominent diseases will be explained further based on the area of occurrence. From the highest, those seven diseases are Chronic Respiratory Disease with 11 reports or 15% of the total reports, followed by Infectious Bronchitis with 9 reports (13%), Complicated Chronic Respiratory Disease with 8 reports (11%), Avian Metapneumovirus, Heatstress, Mycotoxicosis and Coccidiosis each with 6 reports (8%). Other diseases were Newcastle Disease and Necrotic Enteritis each with 3 cases (4%), Helminthiasis and Infectious Laryngotracheitis each with 2 cases (3%). And the rest of the reports are Avian Influenza H9, Infectious Coryza, Dysbacteriosis, Mismanagement, Metabolic Disorders, Post Vaccinal Reaction, Fowl Pox, Runting and Stunting Syndrome, Aspergillosis and DOC Quality each with 1 case (1%) consecutively.

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 May 2024 there were 11 cases of Chronic Respiratory Diseases or 15% of total reports – 4 reports from broilers and 7 reports from layers. Areas of infection can be seen in Figure and Table 1.

Areas	Species	No of Cases
Banyuasin, South Sumatera	Layer	1
Tangerang, Banten	Layer	2
Sukabumi, West Java	Layer	1
Sukabumi, West Java	Broiler	1
Karanganyar, Central Java	Layer	2
Karanganyar, Central Java	Broiler	1
Ungaran, Central Java	Broiler	1
Boyolali, Central Java	Broiler	1
Sleman, Yogyakarta	Layer	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.



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 May 2024, the avian coronavirus, again, marked its place as the second highest infection reported with 9 cases, which equal to 13% of the total May reports. 6 report from broilers and 3 reports from layers. The areas affected by IB is shown in Table and Figure 2.

Areas	Species	No of Cases
Cianjur, West Java	Broiler	1
Bogor, West Java	Broiler	1
Bekasi, West Java	Broiler	1
Kuningan, West Java	Broiler	1
Sukoharjo, Central Java	Layer	1
Batang, Central Java	Layer	1
Boyolali, Central Java	Broiler	1
Mojokerto, East Java	Layer	1
Malang, East Java	Broiler	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.



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 third reported cases in May 2024. Its came with a total of 8 reports or equal to 11% of total reports - 6 reports were from broilers and 2 from layers. CCRD reported areas can be seen in Figure and Table 3.

Areas	Species	No of Cases
Banyuasin, South Sumatera	Layer	1
Negeri Sakti, Lampung	Broiler	1
Cianjur, West Java	Broiler	1
Bogor, West Java	Broiler	1
Bekasi, West Java	Broiler	1
Ungaran, Central Java	Broiler	1
Kediri, East Java	Layer	1
Pasuruan, East Java	Broiler	1

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.



aMPV

Over the past 20 years, avian metapneumoviruses (aMPV) have been identified as causing infections of the upper respiratory and reproductive tracts in several species of domestic poultry (turkeys, chickens, guinea fowl and ducks). Whatever the clinical form and age of affected birds, pneumovirosis is causing significant economic losses. Respiratory clinical forms were first recognized. Avian metapneumoviruses are especially common in young chickens and turkeys. Respiratory clinical signs are found in turkeys [known as avian (ART) or turkey rhinotracheitis (TRT)] and chickens ["swollen head syndrome" (SHS)]. The viral respiratory infection does not last long. In chickens and turkeys, it is frequently followed by secondary bacterial infections that complicate the diagnosis and that may result in elevated mortality rates. These bacterial infections, in particular Escherichia coli, are an essential etiological component of SHS. In turkey, chicken and duck breeders, the respiratory phase of the aMPV infection can be subtle and the drop in egg production that follows may be the only observed clinical sign.

Areas	Species	No of Cases
Tangerang, Banten	Layer	2
Karanganyar, Central Java	Layer	1
Salatiga, Central Java	Layer	2
Sleman, Yogyakarta	Layer	1

In May 2024, aMPV cases emerged with 6 reports (8%), all reports came from layers. aMPV reported areas can be seen in Figure and Table 4. Factors contributing to or aggravating avian metapneumovirosis are age (young birds are more susceptible to respiratory forms), rearing conditions (poor ventilation, excess ammonia and dust in the atmosphere, an insufficient heating are all aggravating factors) and intercurrent diseases with respiratory tropism [Escherichia coli, Avibacterium paragallinarum (Haemophilus paragallinarum), Ornithobacterium rhinotracheale, Bordetella avium, Riemerella anatipestifer, Mycoplasma gallisepticum, etc.] or genital tropism (Mycoplasma spp. Escherichia coli, infectious bronchitis virus, paramyxovirus types 1 or 3, egg drop syndrome 76, etc.) or that are immunosuppressive (hemorrhagic enteritis in turkeys, infectious bursal disease in chickens, etc.).

Isolated for the first time in 1986, aMPV belongs to the genus Metapneumovirus in the Pneumovirinae subfamily, Paramyxoviridae family. The viral particles of aMPV are enveloped, rounded or elongated, varying in size between 150 and 800 nm. The viral genome consists of a single-stranded RNA monocatenary molecule of negative polarity. The aMPV are fragile in the environment and easily

inactivated by common disinfectants. Their horizontal transmission is very effective during the week following the infection. Transmission is by air and by direct contact.



The prevention of disease requires proper flock management and control of predisposing or aggravating factors. Prophylactic vaccination is possible from vaccines developed from aMPV subgroups A or B in Europe or from aMPV subgroup C in the United States. Live attenuated vaccines can be administered to young birds by nebulization or by drinking water. Adjuvanted inactivated viral vaccines can then be given by injection to breeders before the start of egg production. The combination of the two types of vaccine provides a higher and more homogeneous immunity level, and a better protection against a drop in egg production.

HEATSTRESS

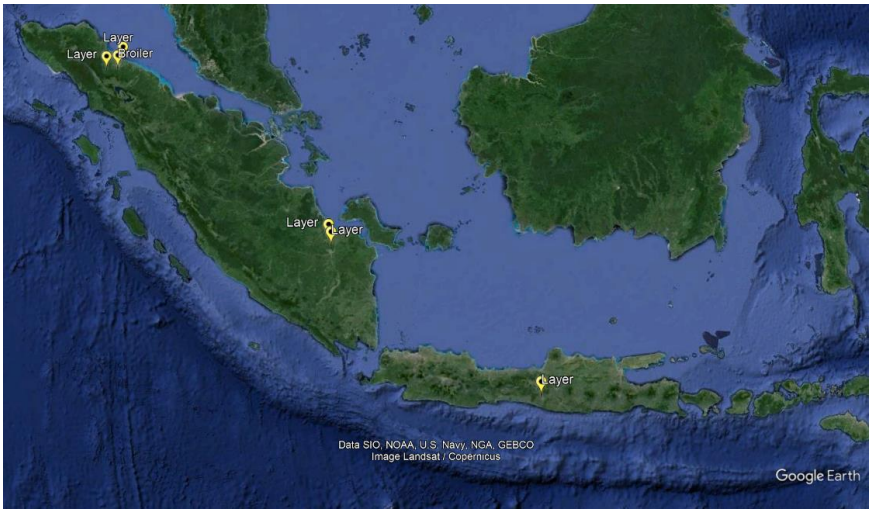
Since February 2024, BMKG analysis have been mentioned that the average temperature on the archipelago reached the highest in the same months ever since 1981 with 27,4°C. An increase of temperature as +0,9°C compared to usual situation. With the extreme weather condition together with managemental failure to overcome the high humidity, it was not surprising that Heatstress continuously reported in May 2024. There were 6 cases of Heatstress (8% of total reports), 1 case from broilers and 5 cases from layers. Areas with Heatstress can be seen in Table and figure 5.

Areas	Species	No of Cases
Tanjung Langkat, North Sumatera	Layer	1
Gunung Kelawas, North Sumatera	Broiler	1
Pantai Labu, North Sumatera	Layer	1
Banyuasin, South Sumatera	Layer	2
Sleman, Yogyakarta	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^{0}C (106^{0}F). If body temperature rises more than 4^{0}C 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).



MYCOTOXICOSIS

The period of changing seasons has always been a polemic for poultry farmers and feed producers. Prolonge rainy season causes a decrease in the quality of feed raw materials, the growth and development of toxin-producing fungi is very fast. This situation results in high reports of Mycotoxicosis case. In May 2024, Mycotoxicoses case reports reached 6 cases (8%), 1 report came from broilers and the other 5 from layers. Figure and Table 6 shows the area affected by Mycotoxicosis.

Areas	Species	No of Cases
Tanjung Jati, North Sumatera	Layer	2
Tandem, North Sumatera	Layer	1
Pantai Cermin, North Sumatera	Layer	1
Kisaran, North Sumatera	Layer	1
Pesawaran, Lampung	Broiler	1

Mycotoxicoses is a general term for toxic and/or carcinogenic diseases caused by ingestion, inhalation, or direct contact of feed contaminated with one or more mycotoxins. These diseases may vary on the severity, target sites, and mechanism of toxicity. The severity of the disease condition varies in type and dose of mycotoxins as well as the duration and frequency of contact with mycotoxin/mycotoxins. Poultry ingesting mycotoxin in high concentration may likely suffer from acute or sub-acute disease where toxic effects directly affect specific tissues or organs. However, in lower levels with continued introduction of mycotoxins may cause chronic disease, which may further worsen by secondary infections due to their immune suppressive effects. Specific mycotoxins affect various organs and/or tissues, such as the liver, kidneys, brain, mucous membrane of the gastrointestinal, respiratory tract, reproductive and urogenital system, and skin. Mycotoxins are secondary metabolites of diverse composition that divided in different families of toxic chemical products (aflatoxins, trichothecenes, etc). A single species can produce several mycotoxins (aflatoxins and cyclopiazonic acid by A. flavus).

Mycotoxin contamination can occur throughout the production chain from the field to the feeders. Some contamination can occur before harvest (e.g., Fusarium toxins), others occur during storage (e.g., ochratoxin A) depending on hydrothermal conditions. The mixing of raw materials having different levels

of humidity and affinity for water favors fungal growth. Recent studies suggest that a mixture of mycotoxins at below recommended levels may result in the appearance of clinical signs in exposed poultry. Toxic effects of mycotoxins can occur at toxin concentration below detection limits. Their toxic effects in poultry are very diverse, varying from immune suppression to death in severe cases, depending on toxin related (type of mycotoxins, level and duration of intake), animal-related (species, sex, age, breed, general health, immune status, nutritional condition), and environmental factors (farm management, biosecurity, temperature, humidity).



COCCIDIOSIS

In May 2024, Coccidiosis came as the seventh highest reported diseases with 6 cases or equal to 8% of the total reports - 5 cases from broilers and 1 case from layers. Figure and Table 7 shown were Coccidiosis have been reported.

Areas	Species	No of Cases
Sukabumi, West Java	Layer	1
Sukabumi, West Java	Broiler	1
Bekasi, West Java	Broiler	1
Bogor, West Java	Broiler	2
Demak, Central Java	Broiler	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.

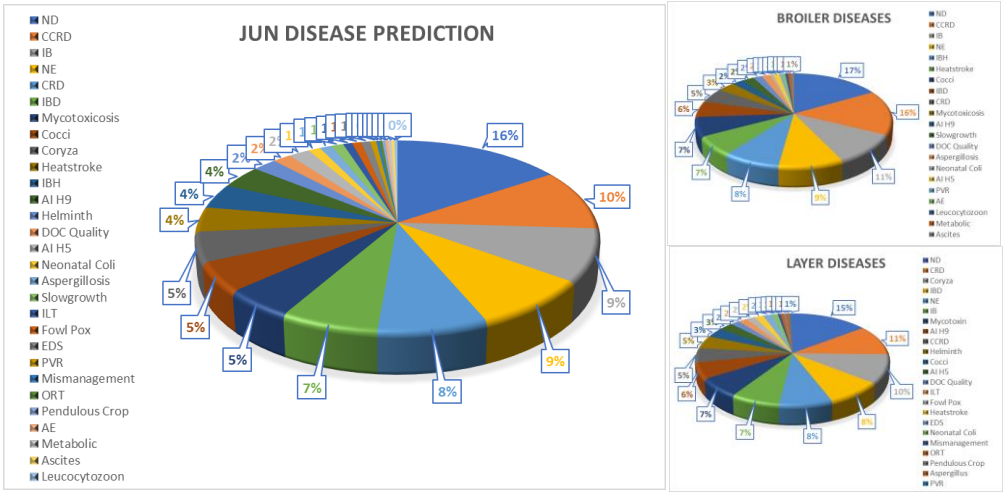
The parasites responsible for coccidiosis in poultry belong to the family of the *Eimeriidae*, all obligate intracellular parasitic protozoa. The structure of the sporulated oocyst allows for the distinction between *Eimeria spp*. and other parasites like *Cryptosporidium spp*. Eimeria sporulated oocysts 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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JUN 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 June 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 June 2024. Especially when the extreme weather continuous. The three diseases with the highest probability are: ND 16%, CCRD 10%, and IB 9% opportunity. The three highest predicted diseases in broilers are : ND 17%, CCRD 15%, and IB 10% opportunity. While layers prediction are ND 15%, CRD 11% and Coryza 10% probability. This prediction is intended to help the poultry community improve its prevention program, not as a guarantee of accuracy.

CONCLUSION

In May 2024, the GPS Diseases Surveillance program have been reporting 72 cases from 21 different diseases or condition – broilers reported 29 cases while layes reported 43 cases. From the highest, seven most prominent diseases are Chronic Respiratory Disease with 11 reports or 15% of the total reports, followed by Infectious Bronchitis with 9 reports (13%), Complicated Chronic Respiratory Disease with 8 reports (11%), Avian Metapneumovirus, Heatstress, Mycotoxicosis and Coccidiosis each with 6 reports (8%). Other diseases were Newcastle Disease and Necrotic Enteritis each with 3 cases (4%), Helminthiasis and Infectious Laryngotracheitis each with 2 cases (3%). And the rest of the reports are Avian Influenza H9, Infectious Coryza, Dysbacteriosis, Mismanagement, Metabolic Disorders, Post Vaccinal Reaction, Fowl Pox, Runting and Stunting Syndrome, Aspergillosis and DOC Quality each with 1 case (1%) 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.