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Disease Surveillance and Vaccination Titre Monitoring

Broiler Breeder Flocks — Routine Schedule

This schedule defines the minimum diagnostic surveillance and serological titre monitoring panel for a commercial broiler breeder flock, from day-old placement through to depletion. The objectives are three-fold: (a) to verify vaccine take and timing, (b) to detect field exposure or active pathogen shedding at the earliest opportunity, and (c) to confirm that the breeder is transferring adequate passive immunity to the broiler progeny. The schedule should be implemented at flock and house level; results are interpreted alongside production records, post-mortem findings and vaccination history.

1. Surveillance and titre monitoring schedule

Age	Tests / parameters	Method	Sample	Objective / rationale
Brooding — placement (Day 1 to 7)				
Day 1 (0 wk)	Salmonella *spp.*, Avian astrovirus, Chicken anaemia virus (CAV), MG, MS	PCR	Chick-box paper liners; meconium; pooled faecal sample (10–20 chicks); thymus, content from choanal cleft/air sac/trachea/yolk sac	Screen for vertically transmitted pathogens from the breeder source.
Brooding — pre-grower (21–28 days)				
21–28 d (3–4 wk)	Marek's disease virus (MDV)	PCR	Feather follicle pulp, spleen	Confirm vaccine take — replication of HVT or Rispens (CVI988) vaccine virus in the feather pulp.
21–28 d (3–4 wk)	*Mycoplasma gallisepticum, M. synoviae*	PCR	Choanal swab	Confirm flock freedom from MG and MS at the end of the brooding phase.
21–28 d (3–4 wk)	Infectious bursal disease (IBD)	ELISA	Serum	Monitor maternal antibody decline and post-priming response; refine timing of subsequent IBD boosters.
Growing (10–11 weeks)				
70–77 d (10–11 wk)	ND, IB, MG, MS, CAV, aMPV, ILT, REO, FadV	ELISA	Serum (20–25 birds per house)	Assess post-primary vaccination titre response across the full panel; differentiate vaccination from field exposure; compute flock uniformity (CV %).
Pre-lay (16–24 weeks)				

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Age	Tests / parameters	Method	Sample	Objective / rationale
112–119 d (16–17 wk)	Egg drop syndrome (EDS), Avian encephalomyelitis (AE), Chicken anaemia virus (CAV)	ELISA	Serum (20–25 birds per house)	Confirm pre-lay seroconversion for the three antigens whose passive antibody protects the broiler progeny — non-negotiable before transfer to the laying house.
112–119 d (16–17 wk)	MG, MS	DIVA PCR	Choanal swab	Discriminate live vaccine strain (e.g. *M. gallisepticum* ts-11 or F-strain; *M. synoviae* MS-H) from wild-type field strain in vaccinated flocks.
161–168 d (23–24 wk)	ND, IB, MG, MS, aMPV, REO, IBD	ELISA	Serum (20–25 birds per house)	Pre-lay baseline panel; verify uniformity (target CV % < 30) before transfer to the production house.
Production — onset of lay (28 weeks)				
28 wk	ND, IB, AI, Salmonella *spp.*, Avian astrovirus	PCR	Cloacal swab (pooled, 10 birds per pool)	Detect active viral and bacterial shedding at onset of lay; investigate any unexplained early production drop.
Production — peak lay (32–35 weeks)				
32 wk	ND, IB, AI, Salmonella *spp.*	PCR	Cloacal swab (pooled)	Shedding surveillance during peak lay; rule out asymptomatic field circulation.
35 wk	ND, IB, MG, MS, aMPV, REO, IBD	ELISA	Serum (20–25 birds per house)	Mid-cycle titre and uniformity check; early warning of field challenge during peak production.
Production — mid-cycle (40 weeks)				
40 wk	ND, IB, AI, Salmonella *spp.*	PCR	Cloacal swab (pooled)	Continued shedding surveillance; positive Salmonella PCR should be followed by culture and serotyping (NPIP-style escalation).
40 wk	MG, MS	DIVA PCR	Choanal swab	Re-confirm vaccine versus wild-type discrimination in live-vaccinated flocks.
Production — late cycle (48–50 weeks)				
48–50 wk	ND, IB, MG, MS, REO, IBD, aMPV	ELISA	Serum (20–25 birds per house)	Late-cycle immunity assessment; decide on booster vaccinations to sustain progeny immunity until depletion.

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2. Sampling principles

- Serology panels require a representative sample size of 20–25 birds per house, drawn randomly from across the floor area, to support a reliable uniformity calculation.
- Pooled cloacal or choanal swabs may be used for PCR shedding surveillance — typically up to 10 birds per pool, with the pool clearly labelled to allow back-tracing if positive.
- For any molecular diagnosis (PCR), sampling must be done at least 7–10 days after the most recent live vaccine of the same antigen — for example 10 days post live ND-LaSota, 7 days post live IB-H120, 10 days post live IBD intermediate-plus — to avoid amplifying vaccine virus and producing a false positive.
- Serology samples should preferably be collected before the next scheduled live vaccination to avoid confounding the titre response.
- Sample submission must follow the ARAPL PCR Sample Dispatch Procedures (cold chain, leak-proof packaging, completed Sample Submission Requisition Form).

3. Result interpretation

- ELISA results are reported as Geometric Mean Titre (GMT) and Coefficient of Variation (CV %). Target CV % is < 30 in a uniform, well-vaccinated flock; values consistently above 40 indicate poor uniformity and warrant review of vaccination technique, cold chain or field exposure.
- DIVA PCR distinguishes the vaccine strain from wild-type field strain — interpretation depends on the specific vaccine used in the flock; this information must be supplied with the sample.
- A single shedding PCR positive at low cycle threshold (Ct) should trigger immediate follow-up — repeat sampling at house level, post-mortem of any morbid bird, and review of biosecurity. Salmonella PCR positives are escalated to culture and serotype identification.
- Equivocal results (titre near cut-off, weak PCR signal at high Ct) should be re-sampled at a 14-day interval before changing the vaccination programme.

4. Important notes

- This schedule is a minimum framework. The treating veterinarian may add additional time-points or analytes based on regional disease pressure, flock history, hatchery status, or any production deviation.
- All molecular diagnoses (PCR, DIVA PCR) require a sampling interval of at least 7–10 days after the most recent live vaccine of the same antigen, to avoid amplifying vaccine virus.
- Vaccination history, age in days, house identification, and any clinical observations must be supplied with the samples. Serology interpretation is impossible without the vaccination programme.
- All results are reported with reference to the ELISA kit manufacturer's cut-off values; kit-to-kit comparisons should be made with caution.

5. Abbreviations

Abbreviation	Expansion	Abbreviation	Expansion
AE	Avian encephalomyelitis	**HI**	Haemagglutination inhibition
AI	Avian influenza	**IB**	Infectious bronchitis
aMPV	Avian metapneumovirus	**IBD**	Infectious bursal disease (Gumboro)
CAV	Chicken anaemia virus	**ILT**	Infectious laryngotracheitis
CV %	Coefficient of variation, expressed as a percentage	**MDV**	Marek's disease virus
DIVA	Differentiating Infected from Vaccinated Animals	**MG**	*Mycoplasma gallisepticum*
EDS	Egg drop syndrome (EDS-76)	**MS**	*Mycoplasma synoviae*
ELISA	Enzyme-linked immunosorbent assay	**ND**	Newcastle disease (Ranikhet disease)
FAdV	Fowl adenovirus	**PCR**	Polymerase chain reaction
GMT	Geometric mean titre	**REO**	Avian reovirus

6. Laboratory contact

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- *Sample receiving hours: Monday to Saturday, 10:00 to 18:00 IST.*
- *Samples received outside these hours will be logged in on the next working day*
- *For emergency dispatches please call the mobile number above in advance.*

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