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Disease Diagnosis In Poultry – Modern Approach

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Kolkata, India

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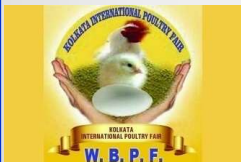
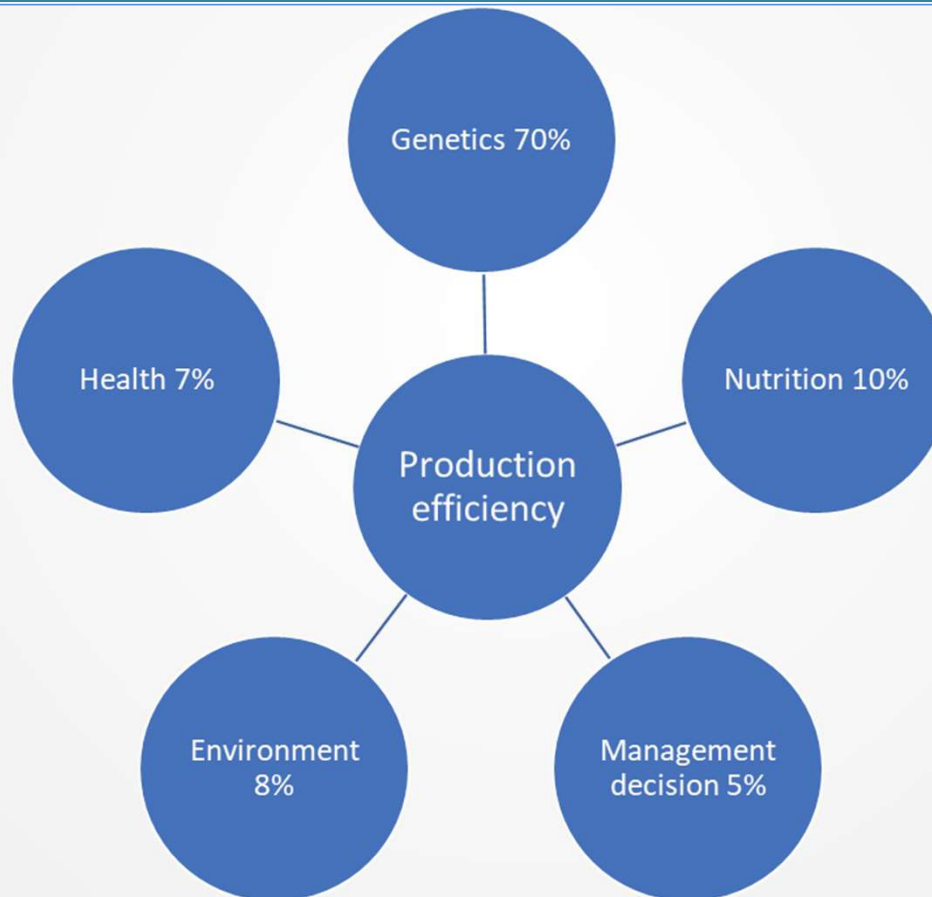
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Factors affecting poultry production

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Diseases eat away profits gained through genetics, nutrition and management



- Early detection of poultry diseases
- Right action plan
- Loss minimization



Disease diagnosis - Roadmap

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1. Information

2. Inspection

3. Postmortem

4. Tentative diagnosis

5. Laboratory investigation

6. Differential diagnosis

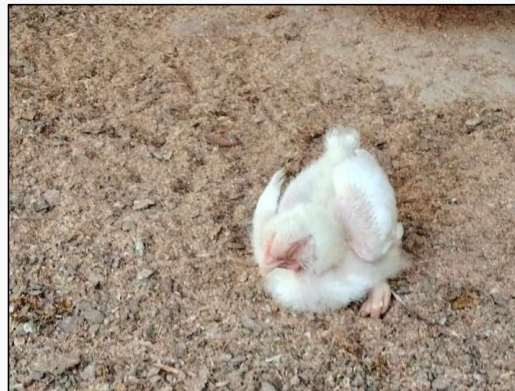
7. Reconfirmation

8. Action Plan



Conventional Approach- Clinical Signs & Symptoms

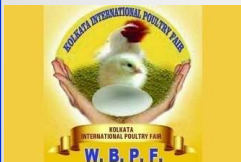
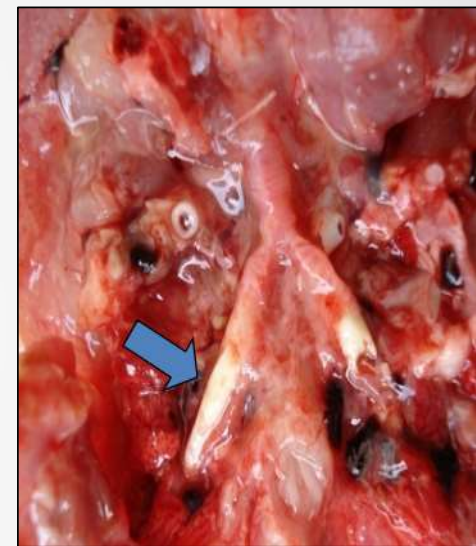
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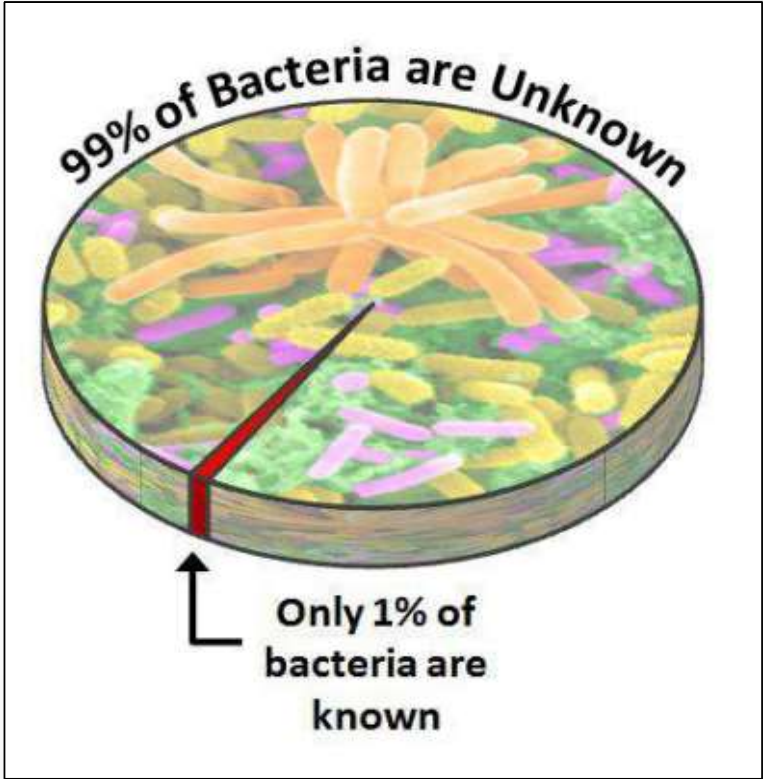
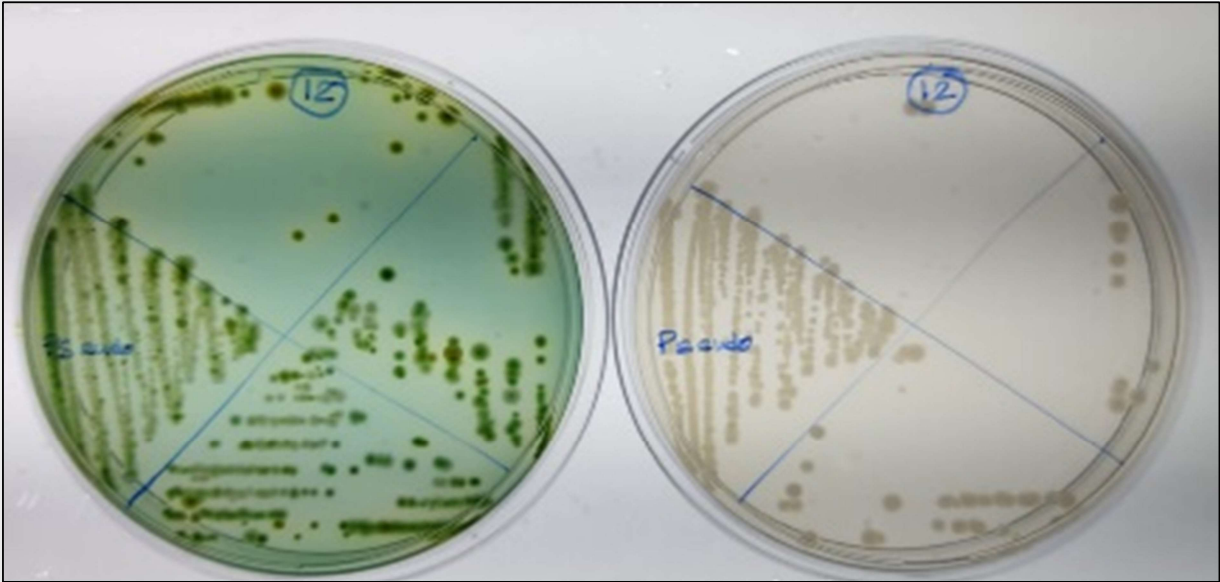


Post Mortem

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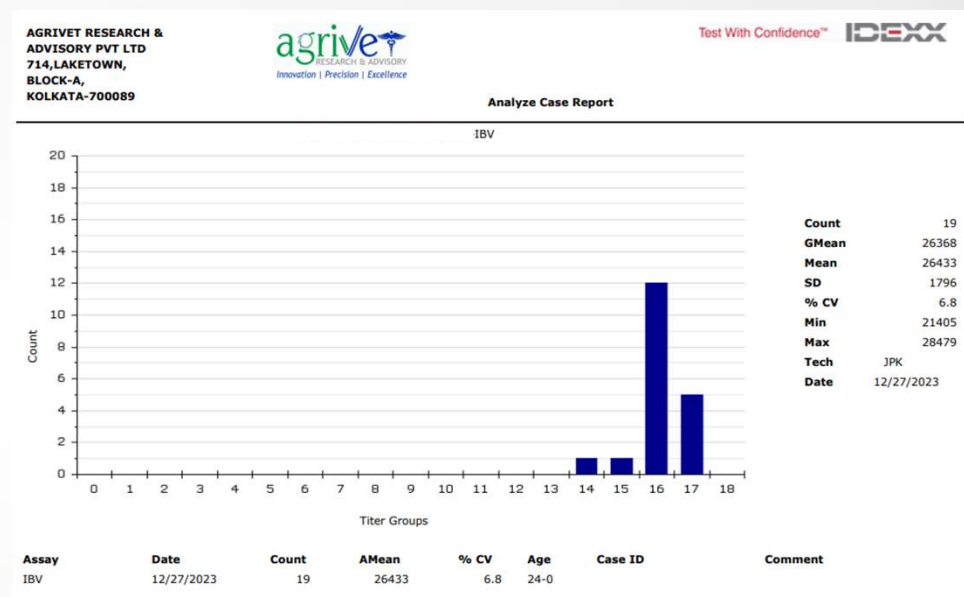
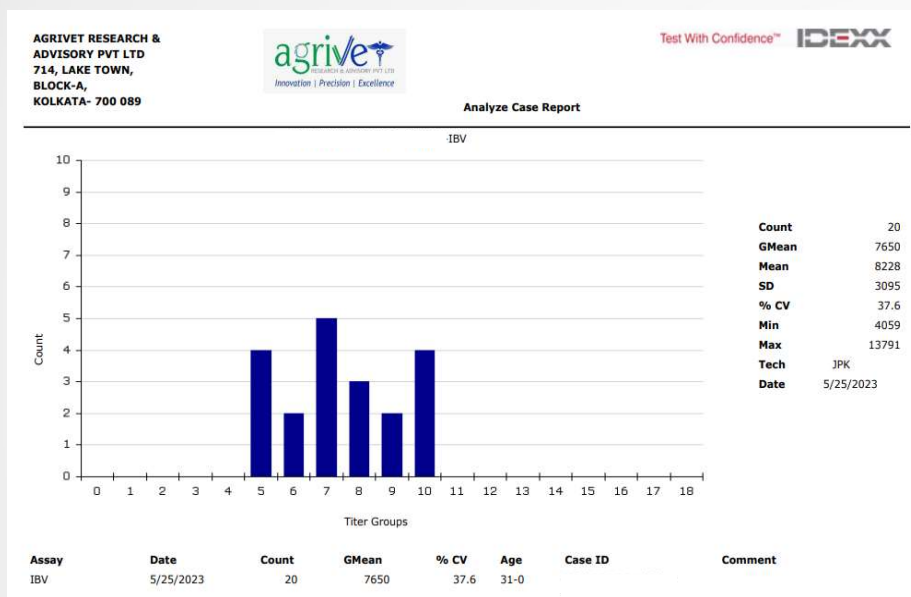
Health expert must have knowledge of classical clinical signs and symptoms of poultry diseases





Serology

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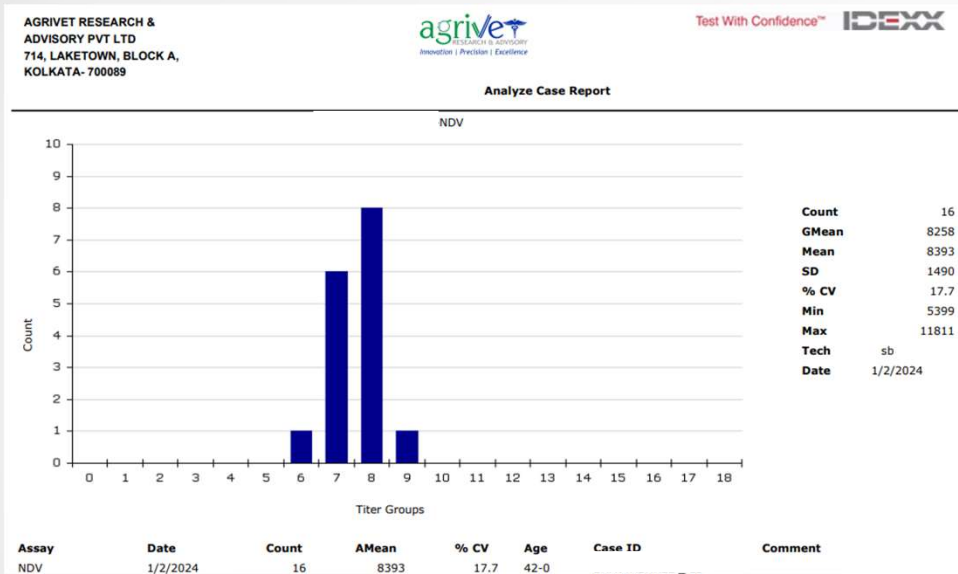
Ab titres are partially protective. There is no indication of field challenge.

Very high and uniform Ab titre which indicates exposure to field infection

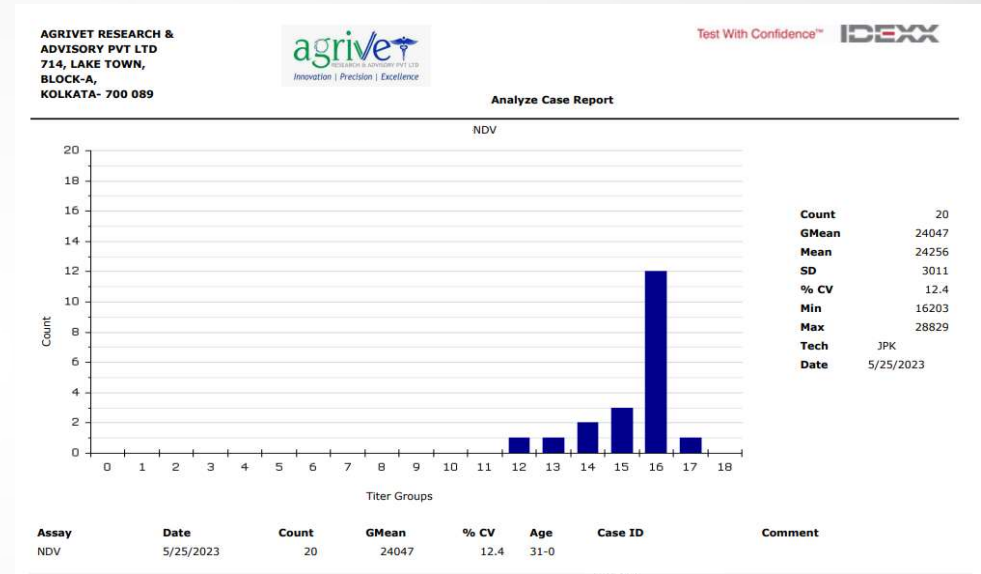


Conventional diagnosis: Seromonitoring

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Ab titres are partially protective. There is no indication of field challenge.



Mean Ab titre is very high considering age. High chance of clinical infection



Conventional disease diagnostic tools have some limitations.



Molecular diagnosis: The New Approach

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Detects the pathogen specific nucleic acids in the samples and hence the method is



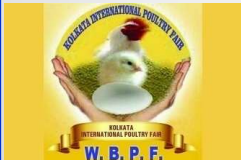
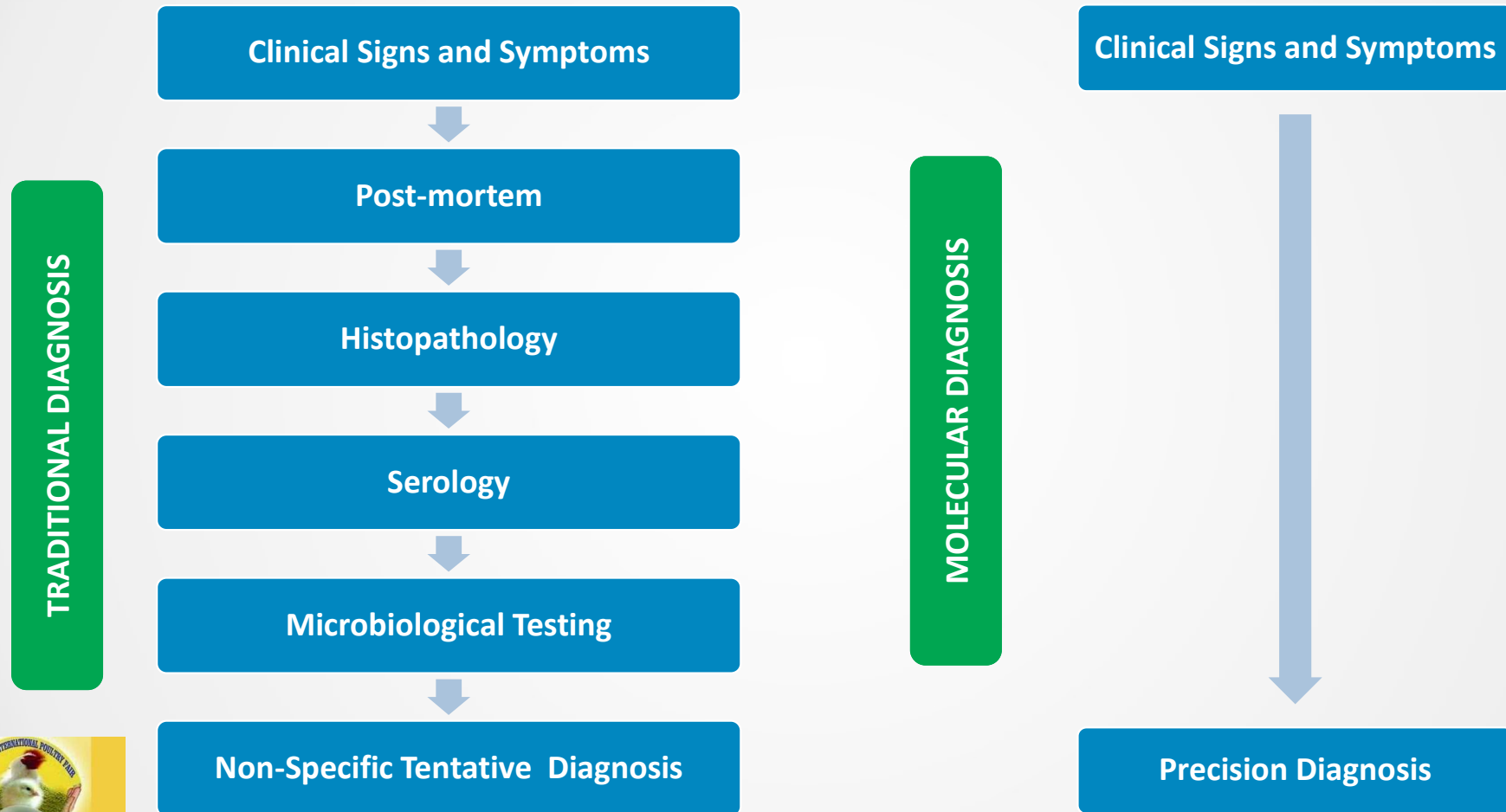
Truely sensitive

Truely specific

Samples can be environmental and/or biological materials

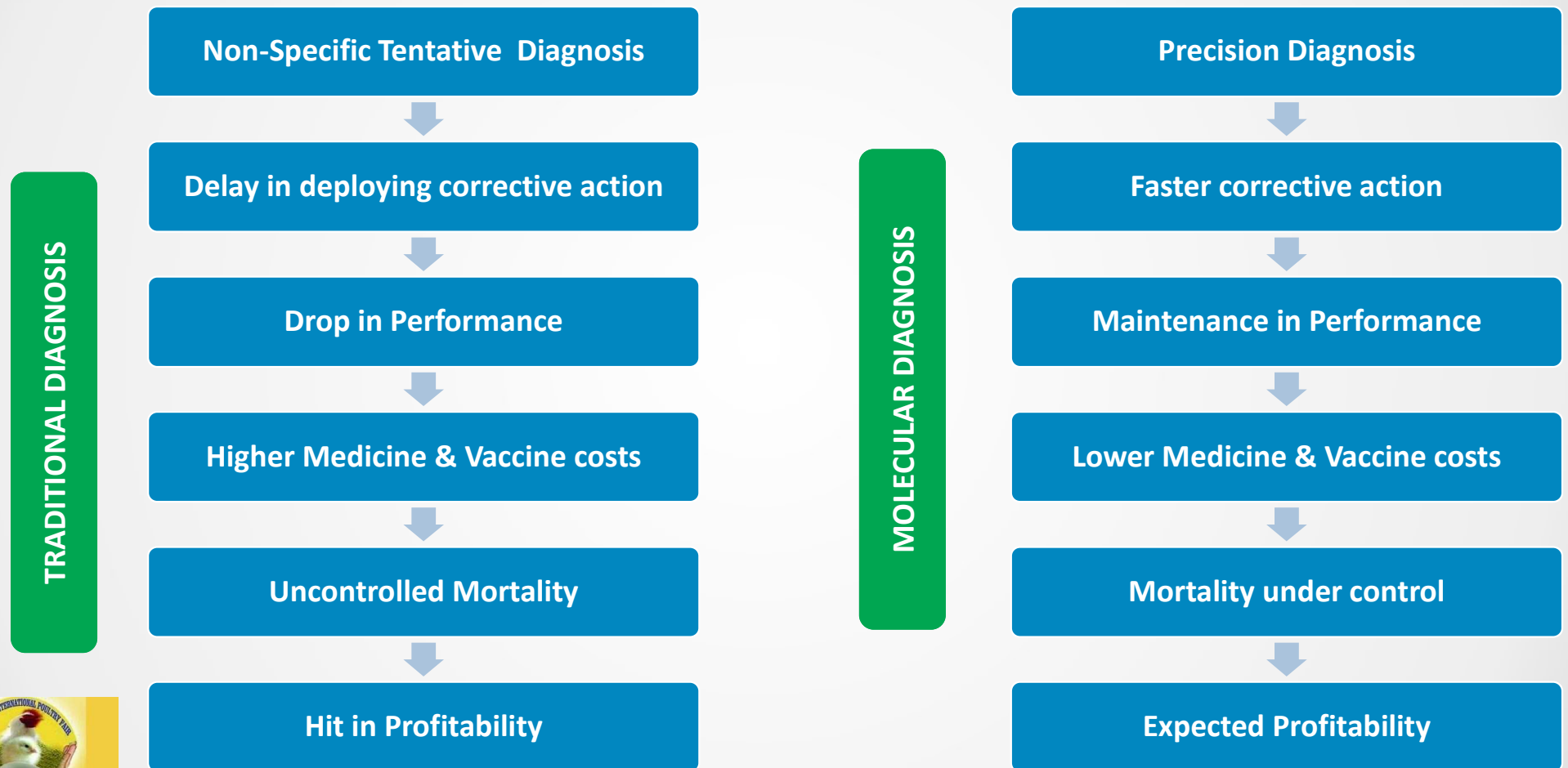


Traditional Vs Molecular Diagnosis: TIME



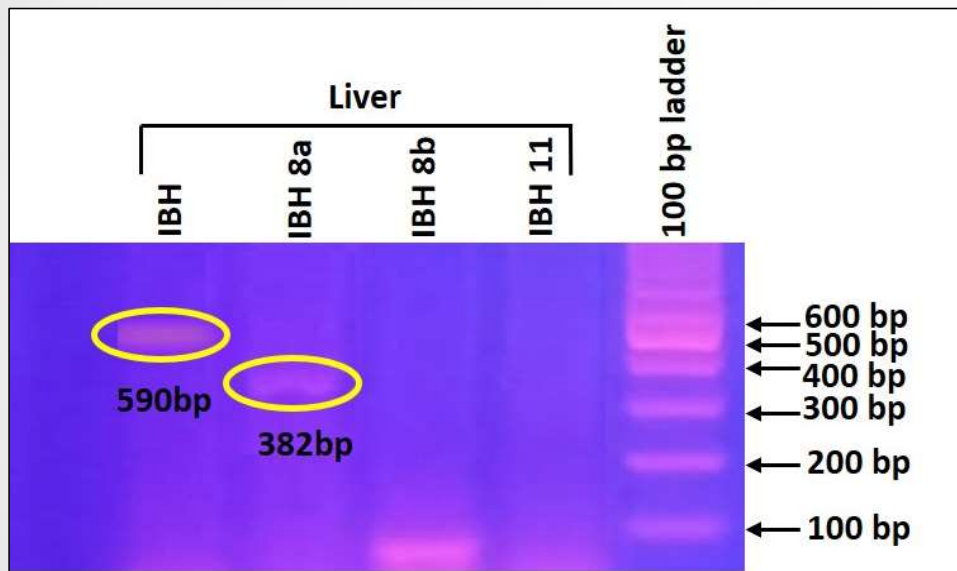
Traditional Vs Molecular Diagnosis: MONEY

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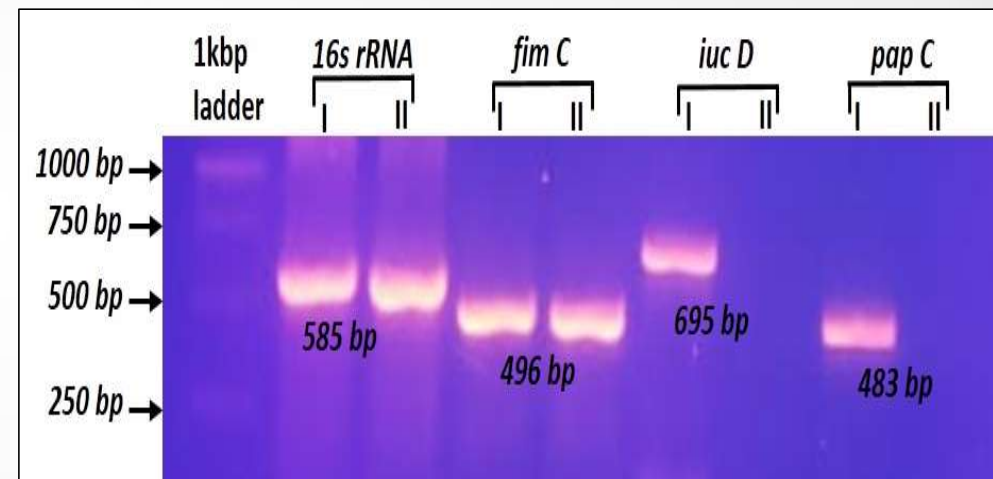


Molecular diagnosis- PCR

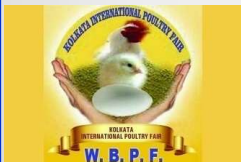
Technique to amplify a segment of DNA, generating million of copies of a DNA sequence



Detection of viral diseases using PCR

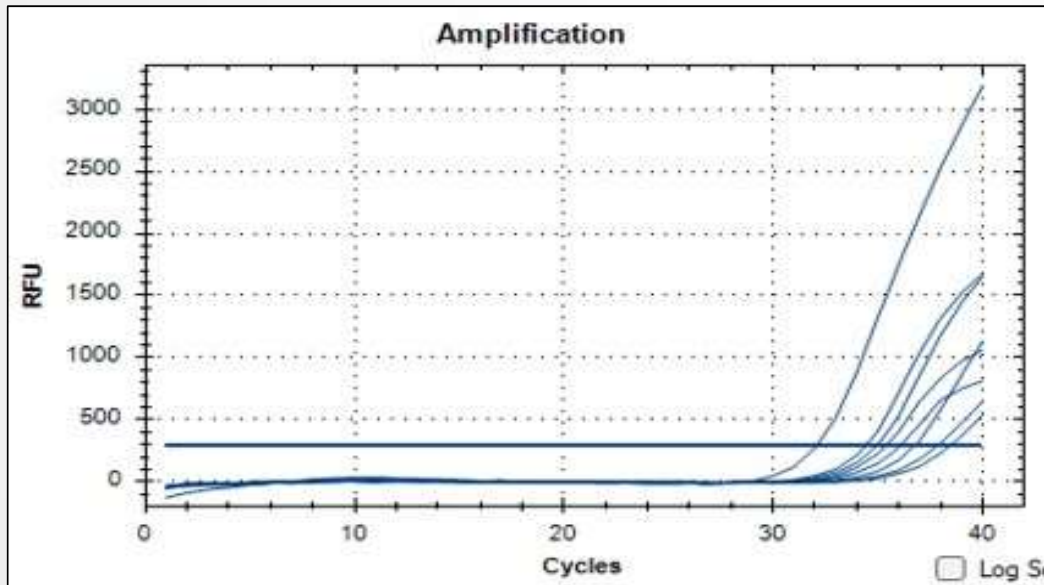


Detection of APEC infection in poultry faeces & feed samples using PCR



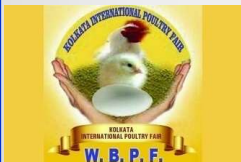
Molecular diagnosis - Real Time PCR

SAMPLE	IBV- Massachusetts (Ct value)	IBV-4/91 (Ct value)	IBV-D274 (Ct value)	ILT (Ct value)	NDV (Ct value)
Pooled tracheal sample	36.09	32.09	35.39	38.17	37.58



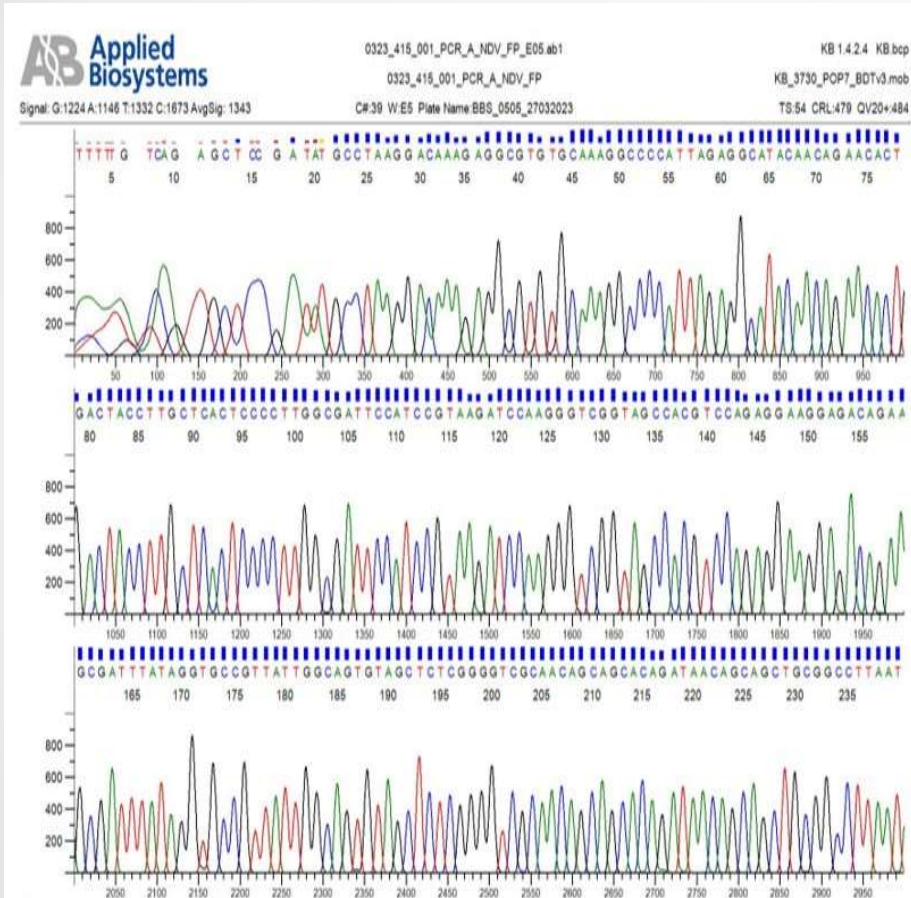
- Variant of PCR used in the detection of gene expression.

- More sensitive than PCR



Molecular diagnosis - Sequencing of PCR products

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viruses and other sequences | 83 leaves

- Newcastle disease virus isolate XZ-4-07-Ch fusion protein (F) gene, complete cds
- Newcastle disease virus isolate HA-3-07-Ch fusion protein (F) gene, complete cds
- Newcastle disease virus strain TYQ/Shanxi/07 fusion protein (F) gene, partial cds
- Newcastle disease virus strain MQ/Liaoning/05 fusion protein (F) gene, partial cds
- Newcastle disease virus strain CK/CH/HLJ/4/07 fusion protein (F) mRNA, complete cds
- Newcastle disease virus strain CK/CH/HLJ/3/07 fusion protein (F) mRNA, complete cds
- Newcastle disease virus strain JL-1, complete genome
- Newcastle disease virus isolate D58 fusion protein (F) gene, complete cds
- Newcastle disease virus strain NDV021343 fusion protein (F) mRNA, partial cds
- Newcastle disease virus strain NDV007355 fusion protein (F) mRNA, partial cds
- Newcastle disease virus strain NDV03214 fusion protein (F) mRNA, partial cds
- Newcastle disease virus strain JL-1 fusion protein (F) gene, complete cds
- Newcastle disease virus strain TN fusion protein (F) gene, complete cds
- Newcastle disease virus isolate QE01 fusion protein mRNA, partial cds
- Newcastle disease virus fusion protein mRNA, complete cds
- Newcastle disease virus strain Lasota fusion protein (F) gene, complete cds**
- Newcastle disease virus isolate JS05 fusion protein (F) mRNA, complete cds
- IclQuery_48171

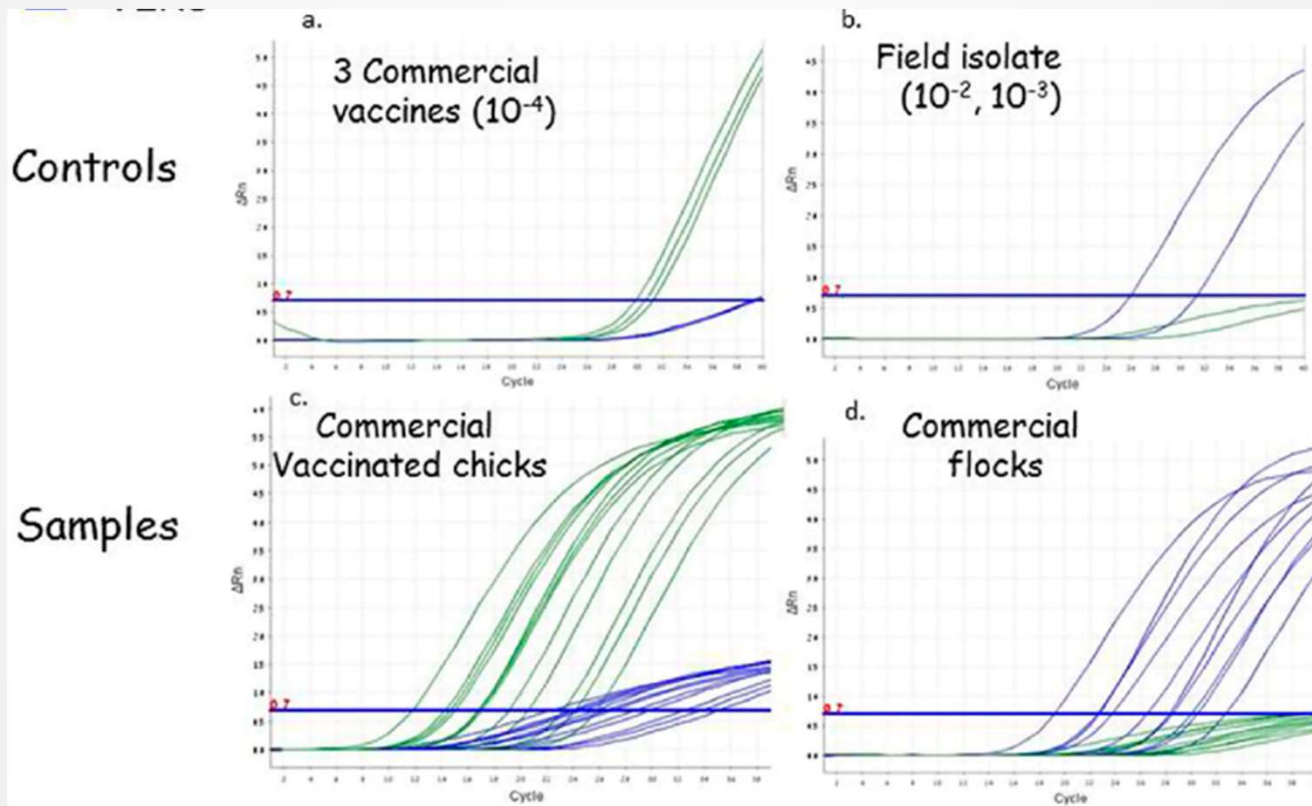
Taxonomy classification of the sequenced region against the genomic database



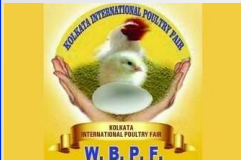
Molecular diagnosis - DIVA PCR

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It is a duplex assay aimed to distinguish between wild-type strains and the vaccine strains



- We can investigate mixed infection.
- We can detect infectious causes of Immuno-suppression.
- We can measure vaccination programme efficacy.
- We can understand the epidemiology of the disease.



How to send samples for molecular diagnosis

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Swab samples in DNA/RNA shield vial



FTA card

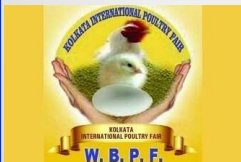
Routine monitoring of poultry disease through molecular diagnosis

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New Castle disease (ND), Infectious bronchitis disease (IBV)
Avian influenza (AI), Mycoplasma, Adenovirus

Cloacal swab or Oropharyngeal swab impression in FTA card (samples
from 4 birds can be pooled)

Monitoring in every quarter



Take Home Message

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Poultry health monitoring is of utmost necessity to understand the disease complex

Molecular diagnosis is truly sensitive and specific than conventional diagnosis.

Molecular diagnostics gives us confirmative results within less time and saves money leading to profitability.

Laboratory test is an insurance for your flock health





THANK YOU

