



Workshop on Pathology and Avian Diseases Bangladesh Agricultural University December 9-12, 2019



Executive Summary:

Over the course of four days, 47 veterinarians discussed various diseases of poultry, focusing on field diagnostics using critical thinking and knowledge of pathogenesis. Participants included 31 veterinarians from private poultry companies, 3 veterinarians from government offices, and 12 MS or PhD students from Department of Pathology, Bangladesh Agricultural University. All activities were conducted using Adult Learning Theory and in a participatory manner. One morning session was dedicated to poultry necropsy. At the end of the workshop, an internet working group was formed to continue to share information about poultry diseases in the country. Evaluations were overwhelmingly positive with most indicating great support for recurring courses such as this.

For Agenda, see Appendix 1, page 8

For Evaluations, See Appendix 2, page 11

For list of participants, See Appendix 3, page 15

DAY ONE – December 9

Opening Ceremony



Dr. Emdad Choudhury, course organizer and Professor of Pathology, began by thanking the special visitors and giving a warm welcome to all participants. Then he gave some background about the poultry industry in Bangladesh, which is growing by 15-20% per year, and is very close to being able to supply meat and eggs to people from all income levels in the country. His students conducted a survey last year, investigating numbers of outbreaks at poultry farms around the country. Thirty percent of the layer farms in this area had 3-5 outbreaks per year over the last few years, and almost half of all farms surveyed had at least one outbreak. They developed a diagnostic algorithm, which is in use now. Of 92 respiratory infections, only 15 were caused by a single pathogen, the rest all involved more than one pathogen, while some of the outbreaks were due to five different pathogens. Disease is the main constraint in the poultry sectors, so the BAU decided they needed a training program for poultry veterinarians, and this workshop is a result of that planning. The contributions are tripartite – Davis-Thompson Foundation has supplied the speakers, the BAU Department of Pathology has supplied the costs of holding the workshop, and the various poultry enterprises are paying the cost of participation for their veterinary employees.

Dr. Md Abu Hadi Noor Ali Khan, Director of the BAU Research System, welcomed all and reiterated that diseases are often undetected, which costs the farmers important income.

Dr. Nazeem Ahmed, Dean of the Veterinary School, welcomed and thanked all. The poultry industry plays a vital role in supplying eggs and meat to all economic classes. Veterinarians can make contributions through decreasing disease, which is the main problem the industry faces.

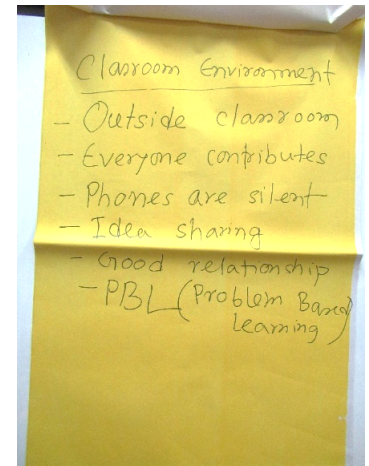
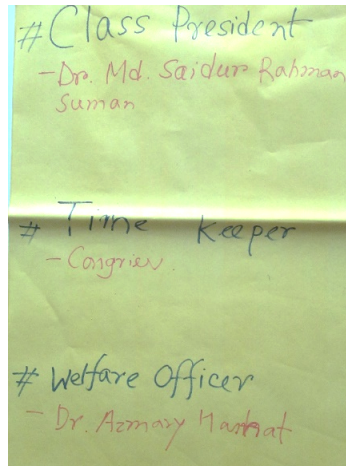
Dr. Subhash Chandra Chakraborty, Coordinator, Committee for Advanced Studies and Research, gave the inaugural address, and on behalf of the university, officially opened the workshop.

Introductions

Each person in the workshop introduced themselves, their academic background, their current position, and expressed expectations for the workshop. Also, each participant had to declare their favorite animal (and chicken was not allowed as an answer).

Election of Class Officers and Classroom Environment

Corrie also reviewed tenets of **Adult learning** and the methodology of instruction that will be used in this course - motivation, relevance, problem-solving, social, 15' rule



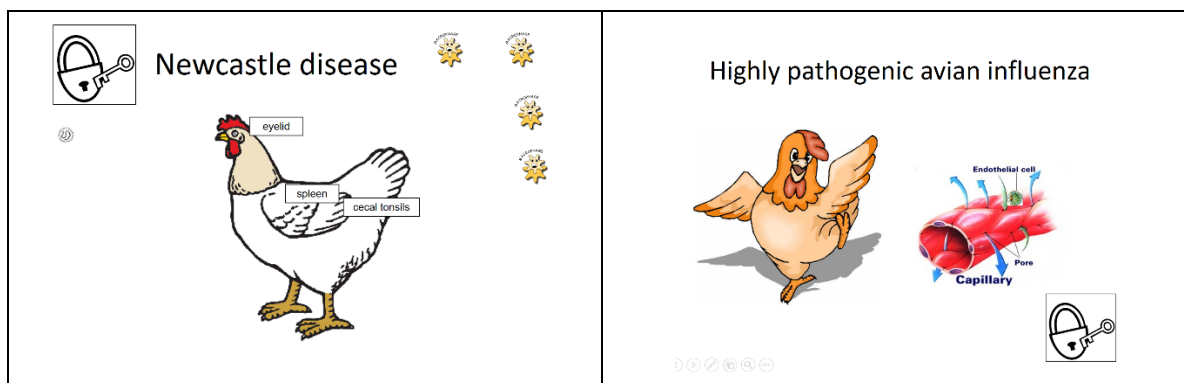
Poultry Diseases that have emerged, and necropsy findings, Dr. Dr. Priyo Mohan Das, retired professor of pathology, discussed how examination of the whole system – from source of birds through husbandry, clinical signs, and necropsy findings – all essential for arriving at differential diagnoses. He then reviewed key findings in each of the major diseases of poultry seen in Bangladesh.

Impact of Transboundary Animal Diseases and Development of Public-Private Partnerships

Groups made lists of diseases, on post-it notes, for three livestock species – cattle, sheep/goats, and chickens. Then Corrie explained the economic impacts of transboundary animal diseases, with the group doing the stadium wave to show how quickly these diseases can spread and cause economic damage. For most transboundary diseases, there are no treatments and so they are not profitable for private veterinarians, and instead, are under the authority of the federal government (public good). Connecting information from the field to the central government regarding where the diseases occur is challenging, in all countries. Each group then put their post-it notes on either the public or private good flip chart. Also, group discussed passive vs. active surveillance and the relative efficiency and cost of each.

Transboundary animal diseases – using case scenarios

Using printed case scenarios, groups worked through the two major transboundary diseases of poultry. At the end, Corrie reviewed pathogenesis of HPAI and ND using a brief powerpoint.



Necropsy – how to

Using interactive techniques, Carmen had participants work through the six steps to a successful necropsy, in preparation for tomorrow’s practical exercise.

Wrap-up of Day One

Four different participants were called on to:

- Explain transboundary animal diseases (including doing the wave)
- Draw VS diagram and differentiate passive vs active surveillance
- Review tenets of adult learning
- Re-iterate six steps of a successful necropsy
- Then class president briefly addressed the class

DAY TWO – December 10

Necropsy

A demonstration necropsy was done – Corrie demonstrated for half the class and Carmen demonstrated for the other half. Then participants formed pairs and each pair did a full necropsy, with one participant using the manual to guide the other. Then, a second bird was necropsied, with a switch of the pair. For every necropsy, the six key samples were collected, and a full necropsy report written.



Assessment of necropsy reports and sample collection

After lunch, back in the classroom, participants were required to evaluate others’ necropsy reports and samples. The purpose of this exercise was to demonstrate how the laboratory workers

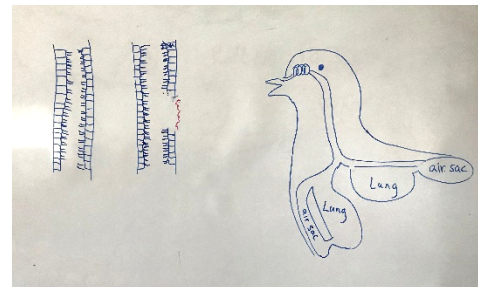
need complete information about the case in order to efficiently process the materials and help arrive at a definitive diagnosis. We made a list of common errors (insufficient history, no date, too many blank spaces, lack of a list of differential diagnoses).

Respiratory Diseases

Using scenarios of six different respiratory diseases of chickens, 6 groups worked through each case (IB, ILT, Mycoplasma, aspergillosis, coryza, swollen head syndrome, fowlpox).



At the end, everyone returned to the main classroom and Corrie gave an overview of the respiratory system in poultry. There was emphasis on the defense system, especially the mucociliary apparatus and how damage to this system (which is done by many pathogens), allows other pathogens to enter. This is the major reason that respiratory disease is often due to more than one pathogen.



The class reviewed three major tracheal pathogens – IB, ILT, *Mycoplasma*. The *Mycoplasma* demonstration involved role-playing with some participants acting as cilia and Corrie playing the role of *Mycoplasma*, inserting between the cilia and causing paralysis.

DAY THREE – December 11

Review of learning objectives

Each of the four learning objectives was translated into Bangla and posted on the wall. We then went through each one and participants gave thumbs up-down-sideways to indicate how well each has been covered so far. We had fully achieved two of the four learning objectives and the other two were partway accomplished.

Then Corrie emphasized the importance of behavioral change following the training. It is not enough to simply achieve the learning objectives, they must be incorporated into the trainees and result in a change in how tasks are accomplished, using the knowledge gained.

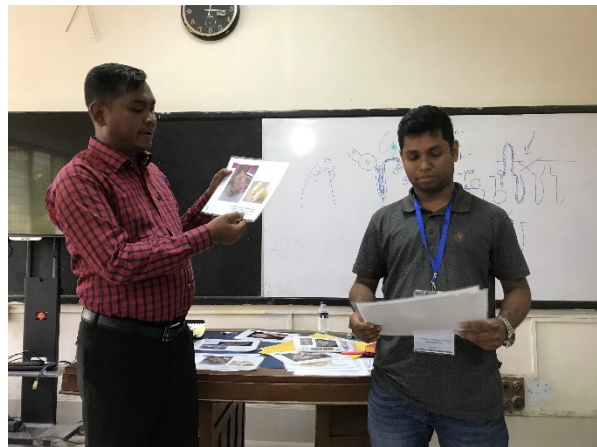
Respiratory Diseases Scenarios – we finished these, then groups reported out on those that were not covered yesterday (colibacillosis, swollen head syndrome, aspergillosis).

Exercise on training farmers – Participants were asked to develop ideas about how to communicate IB, ILT, and Mycoplasma to farmers. Then some practiced this, using Adult Learning principles.

After each disease was reported, Dr. Emdad also cleared the pathogenesis using the native language “Bangla”.

Digestive System Diseases –

Again, this was done using group work, having each group work through cases and answer associated questions. Diseases included – runting-stunting syndrome, necrotic enteritis, coccidiosis, duck virus hepatitis, pullorum.



In group format, participants spent about 2h reviewing each of the 5 scenarios and answering questions at the end.

Then Corrie gave an overview of the digestive system, what happens in each part of the intestine, mechanisms of absorption, mechanisms of diarrhea.

Groups were chosen to present each of the scenarios. After each disease was reported, Dr. Emdad also discussed pathogenesis using native language and local conditions for controlling the disease.

Community engagement in biosecurity for smallholders, Dr. Emdad Choudhury

The first task is to ensure that farmers are motivated, so letting them know the benefits of biosecurity is important. First, identify the hazards, then look at the risks, i.e., the likelihood as to whether or not the hazard will cause damage. Risk analysis is central to devising a biosecurity plan. *Risk assessment* is science-based, *risk management* is policy-based, and *risk communication* is exchange of information and options concerning risk. These three together constitute the risk analysis framework.

DAY FOUR – December 12

Brief review of pathogenesis of the 5 digestive diseases – participants were called on to explain the pathogenesis of each.

Miscellaneous diseases –

These diseases were done the same way, with groups discussing the disease and answering questions posed, then the whole class came together for a review. Diseases covered in this section included: Marek’s disease, T2 mycotoxicosis, infectious hepatitis virus, broiler ascites syndrome, tibial dyschondroplasia, and avian encephalomyelitis.

Review of learning objectives – We read each of the four learning objectives, there was uniformity of “thumbs up” for each of the four objectives.

Similar to before, after each disease was reported, Dr. Emdad also cleared the pathogenesis using the native language “Bangla”.

Path Forward – Dr. Emdad suggested forming an internet group to continue with communications. This was formed BAU-Davis Thomson Foundation Avian Pathology All teaching documents have uploaded in the page.

Closing Ceremony



Two participants chose to speak on behalf of the group of trainees. They discussed the usefulness of the training, highlighting the interactive nature and its efficiency.

Dr. Emdad thanked the participants for their participation, departmental colleagues for their active cooperation and Corrie and Carmen for their active role in the training program.

Corrie and Carmen thanked the participants for their hard work, hospitality, and collegiality.

Certificates were awarded.



Appendix 1. AGENDA



Workshop on Pathology and Avian Diseases Bangladesh Agricultural University December 9-12, 2019

Background

Pathology is a central and foundational discipline that bridges many other disciplines of veterinary medicine. It connects the basic sciences to the clinical sciences and is key in diagnostics. By appreciating the basic mechanisms of disease, and how they function in each organ system, professionals can better know the clinical disease and can more effectively use gross findings to render a diagnosis, and/or select relevant tissues and the tests to perform. This workshop will focus on the pathogenesis of disease for various poultry diseases, and illustrate through case-based examples and activities. Additionally, ensuring that appropriate samples arrive at the laboratory to be useful in diagnosis is essential, and so training in this aspect will be done as well, through necropsy and sample collection practical sessions.

Learning Objectives

At the end of the workshop, participants will be able to:

1. Explain basic mechanisms of disease for the major diseases of concern in poultry in Bangladesh
2. Perform a necropsy on a bird, with collection and packaging of tissues in an appropriate manner for use in the laboratory
3. Use history, clinical signs, and gross lesions observed to create a list of differential diagnoses
4. Explain the private/public distinction of veterinary diseases and implications for the national economy

AGENDA

<u>December 9</u>	<u>SUBJECT</u>	<u>Responsible</u>
8:30	Registration	Dr. Md. Nooruzzaman
9:00	Opening Ceremony	VC, BAU and Dean, FVS
	Introductions - Everyone will get to know all their colleagues	Dr. E. H. Chowdhury
	Adult Learning Principles - The science behind how adults learn; preview of methods to be used in the workshop	Davis-Thompson Foundation
11:00-11:15 Tea Break		

	Vignettes of how serious diseases have emerged and what have been the consequences	Prof. P. M. Das
	Public Good vs Private Good in Animal Health Care Delivery, creating sustainable systems; economics of poultry industry	Davis-Thompson Foundation
1:00 – 2:00 LUNCH		
	Case scenarios – Transboundary animal diseases	BAU plus Davis-Thompson Foundation
3:30-3:45 Tea Break		
	Introduction/Review – Necropsy Techniques	Davis-Thompson Foundation
4:45-5:00	Wrap-up	Davis-Thompson Foundation

<i>December 10</i>	<u>SUBJECT</u>	<u>Responsible</u>
9:00	Necropsy	BAU plus Davis-Thompson
11:00-11:15 Tea Break		
	Necropsy, continued	BAU plus Davis-Thompson
1:00-2:00 LUNCH		
	Exchange of samples, discussion about field-lab connection	Davis-Thompson
	Begin Respiratory diseases – case scenarios	BAU plus Davis-Thompson
3:30-3:45 Tea Break		
	Continuation of Respiratory diseases – case scenarios	BAU plus Davis-Thompson
4:45-5:00	Wrap-up	Davis-Thompson

<i>December 11</i>	<u>SUBJECT</u>	<u>Responsible</u>
9:00	GI diseases – case scenarios	BAU plus Davis-Thompson
11:00-11:15 Tea Break		
	GI diseases, continued, beginning Miscellaneous Diseases – case scenarios	BAU plus Davis-Thompson
1:00-2:00 LUNCH		
	Miscellaneous diseases, continued	BAU plus Davis-Thompson
3:30-3:45 Tea Break		
	Biosecurity	BAU
4:45-5:00	Wrap-up	Davis-Thompson

<i>December 12</i>	<u>SUBJECT</u>	<u>Responsible</u>
9:00	Case scenarios, continued	BAU plus Davis-Thompson
11:00-11:15 Tea Break		
	Tumor diseases, case scenarios	BAU plus Davis-Thompson
1:00-2:00 LUNCH		
	Evaluations Discussion of Path Forward	Dr. Emdad
3:30-3:45 Tea Break		

	Awarding of certificates	BAU and Davis-Thompson
4:45-5:00	Wrap-up	BAU and Davis-Thompson

Instructors:

Dr. Priyo Mohan Das / Dr. M. R. Islam, Professor of Pathology, BAU, Mymensingh

Dr. Emdadul Haque Chowdhury, Professor of Pathology, BAU, Mymensingh

Dr. Corrie Brown, Professor of Pathology, University of Georgia

Dr. Carmen Jerry, Professor of Poultry Pathology, University of California, Davis

Appendix 2. EVALUATIONS

Participants were asked to rank the following items from 5 (excellent/outstanding) to 1 (unsatisfactory/ strongly disagree):

Learning objectives were accomplished	4.9
Instruction was of high quality	4.8
Laboratory exercises were valuable	4.7
Interactive class exercises were valuable	5.0

If you had to sit through this workshop again right now, what would you like to see changed?

Necropsy:

- Freshly dead birds for necropsy would be better
- More necropsy classes
- More time for postmortems
- Increase the time for postmortems
- More opportunities for postmortems
- More time in the laboratory (necropsies)
- Add more information about pathologic changes in specific diseases, during postmortem sessions

Incorporate field visits:

- It would be good to go to a farm
- Add field visit
- Add field experiences
- Field visit to a smallholder farm
- Field visit to understand more about biosecurity
- Need a farm visit
- We need more information on field related diagnostics as well as treatment procedures

Addition of histology information (several comments):

- The topics were perfect but I want more regarding histopathology
- Add some histology
- More information on histopathology of each disease
- Add more about microscopic lesions
- Provide histologic pictures to all participants
- More about histopathology

Duration of program:

- Lengthen to at least 7 days
- Training schedule is not enough for this, we need more time
- Make the workshop longer (10 days)
- Elongate duration

Other comments:

- In my opinion, apart from pathogenesis, you could focus more on epidemiology and prevention or control of diseases
- The language barrier should be removed
- Would like to have written materials about pathogenesis, also add powerpoints

- Add how to diagnose disease in the laboratory
- Lunchtime break was too short
- Treatment related discussions needed
- Would have liked more involvement of BAU teachers, especially to summarize
- Need more written materials
- Add more about nutritional diseases
- Add laboratory diagnostics
- Elaborate more about pathogenesis
- Make pathogenesis explanations using animated videos
- More miscellaneous diseases – cannibalism, vent picking, prolapse, egg eating syndrome)

If you had to sit through this workshop again right now, what would you definitely NOT want to change?

Interactive and participatory training/learning:

- Interactive nature of the training
- Group activities
- Group discussion
- The method of training
- Group discussion
- Interactive class exercises were very valuable
- Don't change interactive class exercises
- Interactive class
- Case studies, laboratory exercise, pathogenesis explanations
- Keep the facilitators and their training methods
- Practical classes and case studies
- Happy atmosphere of learning
- Learning by group discussions
- Everything very friendly and cordial
- Friendly behavior and communication
- Group discussions
- Case studies
- Interactive sessions
- Interactive class exercises
- Instruction
- Method of teaching
- Interactive class exercises
- Group discussion
- Interactive class exercises
- Group discussion
- Problem based learning
- Group study for diagnosis of disease
- Group study and diagnosis of disease
- Group discussion
- Group study and diagnosis of disease
- Interactive class exercises
- Group discussion
- Case scenario system

Necropsy practical:

- Necropsy and case scenarios
- Necropsy work
- Necropsy
- Necropsy
- Necropsy work
- Necropsy

Other comments:

- The two foreign facilitators
- Time duration good
- Trainers, facilitators
- I would not change anything
- Diagrams used
- The instructors!
- Translation when needed was effective
- Madam Corrie's body language
- Biosecurity
- Everything was high quality
- Pictorial presentation of disease pathogenesis
- Everything
- No changes needed
- Biosecurity

Other comments?

Multiple comments expressing gratitude:

- Overall all arrangements were excellent; the sessions were lively and participatory. All the objectives were practical. I am grateful to all of you.
- All the best and thank you!!!
- I am very much grateful to the organizing committee and also to my teachers, trainers, and company, to give me such an opportunity.
- Overall I am very satisfied with this training
- I am grateful to attend this training session
- Excellent workshop – thank you!
- Thank you very much
- The program was very enjoyable
- Food served was excellent
- This workshop was definitely helpful for our field practice
- One new thing that I have learned is how to handle transboundary disease
- I now understand the necessity of knowing pathogenesis for making my differential diagnoses
- This avian workshop is completely fabulous and I learned a great deal about poultry and avian disease pathology
- Accommodation and food were just splendid.
- This is very much informative and helpful for field veterinarians.
- We field veterinarians are lucky to have these sessions.
- Organizers were very skilled in setting up this workshop

- This type of workshop is very effective for knowledge gathering.
- I am very pleased to be able to “fill in holes” in my academic knowledge
- Overall the entire workshop was excellent!
- Overall this training workshop is fantastic in every part and much learning, each session was enjoyable

Requests for continuation of this type of CE:

- This program should continue every year
- CE for the training should be arranged every year
- It’s my great pleasure to attend this workshop. I hope it will be continued every year
- This type of workshop must be organized every year
- Hope to see you again with different type of workshop where we also have discussions on treatment
- We are hopeful you will arrange more of these programs so that we can continue to learn so easily and practically.
- This workshop should continue every year
- We hope this type of training will continue in subsequent years.
- This practice should be continued in future

Appreciation for the interactive learning methods:

- Learning technique was so effective
- Training system is so much excellent.
- Learning procedures are awesome.
- Trainers were cooperative and amicable
- Both trainers were experts and friendly
- The teaching quality was excellent
- Trainers are awesome.

Some requests for histopathology:

- Histopathology hands-on training for upcoming courses
- Next course should incorporate histopathology
- Histopathology basics could be included

Other comments (varied):

- We need to be connected by a network so that information exchange can be easy through this network
- If possible, better accommodations
- Overall the workshop was good. But the schedule was too tight. You can expand the time for the course
- If possible, provide soft and hard copies of lectures
- In frozen birds, hard to see lesions
- Vaccine expert should be added
- I think the next workshop should be longer – 7 days
- Need facility for child care so more women can attend
- More learning objectives can be included
- Increase the training period to 10 or 15 days to include more situations – feed, management, metabolic diseases
- Please provide all gross pathology photos in a book

Appendix 3. List of course participants

Training Workshop on Pathology and Avian Diseases Dept. of Pathology, BAU, Mymensingh, Bangladesh

Sl.	Participant Name	Address	Signature
1.	Dr. Md. Sohrab Ali Mollah	SMS Feeds	
2.	Dr. Toufik Ahmed	Doctor's Agro-vet Ltd.	
3.	Dr. Mohammad Shamsul Alam	Doctor's Agro-vet Ltd.	
4.	Dr. Md. Safiul Islam	Aftab Hatchery Ltd.	
5.	Dr. Md. Moslem Uddin	Aftab Hatchery Ltd.	
6.	Dr. A. J. M. Aminul Haque	Aftab Hatchery Ltd.	
7.	Dr. Md. Jakirul Islam	Agro Industrial Trust	
8.	Dr. Md. Mozammel Hossain	C. P Bangladesh Co. Ltd.	
9.	Dr. Saddam Hossain	EON Group	
10.	Dr. Nazmul Islam	EONGroup	
11.	Dr. Md. Shohidul Islam	Bengal Overseas Ltd.	
12.	Dr. Mohammad Sadequr Rahman	Bengal Overseas Ltd.	
13.	Dr. Mohammad Abdur Rahim	Paragon Group	
14.	Dr. Md. Jahangir Alam	Paragon Group	
15.	Dr. Most. Nazmunnaheer Khatun	Paragon Group	
16.	Dr. S.M. Sorowar Zahan	Paragon Group	
17.	Dr. Md. Abdur Rahim Azad	Paragon Group	
18.	Dr. Md. Akramul Bary	Nourish Poultry & Hatchery Ltd.	
19.	Dr. Md. Taohid Wasim Shaon	Nourish Poultry & Hatchery Ltd.	
20.	Dr. Abdullah Al Momen Sabuj	Nourish Poultry & Hatchery Ltd.	
21.	Dr. Md. Masudul Islam	Nourish Poultry & Hatchery Ltd.	
22.	Dr. Md. Shahriar Parvez	Nourish Poultry & Hatchery Ltd.	
23.	Dr. Md. Golam Yasin	Aman Feed Ltd.	
24.	Dr. Muhammad Saidur Rahman Suman	Renata Ltd.	
25.	Dr. Md. Mohenur Rahman	Renata Ltd.	
26.	Dr. Bitu Chakma	Renata Ltd.	
27.	Dr. Muhammad Shariful Islam Bhuiyan	Renata Ltd.	
28.	Dr. Md. Imam Hossain	Renata Ltd.	
29.	Dr. Md. Abu Sayed	Amrit Global	
30.	Dr. Azmary Hasnat	LDDP, DLS	
31.	Dr. Md. Rashed Ali Shah	Ruhuma Agro	
32.	Dr. Sakhawat Hosen Khan	Khan Vet Care	
33.	Dr. Taslima Akter	PhD Fellow, Pathology	
34.	Dr. Mahmuda Islam	PhD Fellow, Pathology	
35.	Dr. Mustak Ahammed	PhD Fellow, Pathology	
36.	Dr. S. M. Shariful Hoque Belal	PhD Fellow, Pathology and Officer of DLS	
37.	Dr. Sajeda Sultana	PhD Fellow, Pathology	

38.	Dr. Congriev Kumar Kabiraj	MS in Pathology	
39.	Dr. Khairun Nahar Shithi	MS Fellow, Pathology	
40.	Dr. Mahdi Hasan	MS Fellow, Pathology	
41.	Dr. Md. Ariful Islam Khan	MS Fellow, Pathology	
42.	Dr. Nazneen Sultana	MS Fellow, Pathology	
43.	Dr. Moutuza Mostaree	MS Fellow, Pathology	
44.	Dr. Dolena Khanam	MS Fellow, Pathology	
45.	Dr. Nahiatul Zannat	MS Fellow, Pathology	
46.	Dr. Mitu Rani Paul	MS Fellow, Pathology	
47.	Dr. Jannatul Ferdous Subarna	MS Fellow, Pathology and Officer of DLS	