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Broiler Live Production Cost	Average Company
Feed Cost/ton w/o color ($)	244.92
Feed cost /lb meat (c)	20.54
Corn Price per Bushel	4.20
SBM price / ton	332.25
Age at harvest (days)	49.00
Days to 4.6 lbs	38.00
Chick cost / lb (c)	5.78
Vac-Med cost/lb (c)	0.08
WB & ½ parts condemn. Cost/lb	0.14
% mortality	**.**
Sq.Ft. @ placement	0.87
Lbs/sq. ft.	7.56
Downtime (days)	20.00

Data for week ending Oct 20, 2018

Poultry Diagnostic and Research Center
College of Veterinary Medicine
UNIVERSITY OF GEORGIA

Molecular Diagnostics for Bacterial Pathogens

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Culture is often thought of as the gold standard diagnostic method for the detection of bacterial pathogens. Culture however, is labor intensive and the need for incubation and subculture can be time consuming. Visual differences in colony morphology (phenotypic characteristics) can be misinterpreted. Contamination or overgrowth by other bacteria, chronicity of infection, antimicrobial treatment or even poor handling of a clinical specimen (transport duration, temperature etc.) can also decrease the ability to successfully isolate a true pathogen. For these reasons, culture is not the always ideal approach. Additionally there are cases when culture should not be the only diagnostic method used, the confirmation of Mycoplasmosis as an example. In such circumstances, molecular diagnostics are an excellent additional or alternate diagnostic tool to consider.

Molecular diagnostics are Polymerase Chain Reaction (PCR) based tests (for more detailed information on PCR please refer to PIP issue 131). A PCR reaction allows the genetic material from a disease agent to be amplified into significant enough quantities which can then be detected or examined using one or more of several different methods. The different methods of DNA detection or characterization employed at PDRC include Sanger sequencing, Pulsed Field Gel Electrophoresis (PFGE), Multi Locus Sequence Typing (MLST) and next generation sequencing.

The molecular methods that are used in the diagnostic lab have undergone validation. Validation is a process that ensures the assay works; it amplifies the correct genetic material from the target pathogen. Validation also evaluates the sensitivity and specificity of the test. Sensitivity describes how well the test detects very small amounts of material and is defined by the detection limit or how much genetic material is required in the initial sample for successful amplification and identification. Specificity describes how well the test can discern the genetic material from the target pathogen versus genetic material of other pathogens in the same environment or from closely related organisms.

An advantage of molecular techniques compared with traditional culture is improved sensitivity and efficiency (speed). The nature of these tests also allows for detection of genetic material from the target organism, even if the organism is no longer alive, or is in minute quantities. This greatly reduces the negative impact that antimicrobial treatment, chronicity of infection and/or poor sample handling/ transportation can have on successful identification. Although there are numerous benefits associated with the use of molecular methods, it is important to also realize the limitations of these methods. Molecular based methods cannot replace culture and identification, which is still necessary to produce anti-

microbial sensitivity data and for the development of autogenous vaccinations. The fact that the target organism does not need to be viable for detection, also opens the risk for sample contamination/false positive results, or for misinterpretation of a result. Molecular testing results must still be interpreted in the context of the clinical case from which they were collected. Finally, molecular methods have traditionally been more expensive when compared with traditional culture methods, however as equipment and methodology improve, the cost of these tests is decreasing.

When the intent is to use molecular methods for diagnostics, the type of sample collected will vary with the target pathogen and may be impacted by the origin/location that the sample was collected and the destination to which it will be shipped in the case of international shipping of samples. A chart detailing the pathogen and preferred sample site and type can be found below. When in doubt, always contact the receiving diagnostic laboratory to clarify any questions regarding appropriate samples and how to ship them. In many cases, swabs or actual tissues (liver, brain, intestine, and/or spleen) are appropriate. If another diagnostic lab has already done preliminary culture work, isolates can be shipped. When shipping samples internationally, FTA cards are useful in that they render pathogens inert, but preserve the genetic material in the sample. If FTA cards are to be used, the preferred sample can be collected and then applied to the FTA card (ie. Swabs or tissues can be blotted onto the FTA card). Environmental samples such as litter dust and fecal material may also be submitted for environmental monitoring for certain pathogens (ie. Mycoplasma, Salmonella)

Molecular tests available at PDRC targeting bacterial pathogens and preferred sample site/type:

Target pathogen	Test/molecular method [Target(s)]	Preferred sample site and type
Mycoplasma gallisepticum	PCR (+ sequencing for strain typing)	Swabs* from the trachea or choanal (palatine) cleft
Mycoplasma synoviae	PCR (+ sequencing for strain typing)	Swabs* from the trachea, choanal (palatine) cleft, synovial membrane or joint fluid
Mycoplasma gallisepticum vaccine specific PCR	PCR – ts-11	Swabs* from the trachea or choanal (palatine) cleft
Mycoplasma iowae	PCR	Swabs* from the esophagus of pipped embryos/ day old poults or Swabs* from cloaca or phallus of adult breeding turkeys, or semen from breeder toms
Mycoplasma meleagridis	PCR	Swabs* from the trachea or choanal (palatine) cleft or Swabs* from cloaca or phallus of adult breeding turkeys
Mycoplasma species identification - sequencing	PCR + sequencing [16S, Intergenic transcribed region, *rpoB*]	Isolate
Salmonella enterica	PCR [*invA*]	Swabs or actual tissues (liver, spleen, intestine); isolate
Salmonella enterica serotyping	Intergenic sequence [ISR] ribotyping (PCR + sequencing)	
Campylobacter coli	PCR [*ceuE*]	At the farm: Fecal droppings, boot swabs At Slaughter: swabs from cloaca, cecal tissues; isolate
Campylobacter jejuni	PCR [*mapA, hipO*]	
Campylobacteri lari	PCR	
Pasteurella multocida (Fowl Cholera)	PCR [16S rRNA]	Swabs from lesion (swollen wattles, sinuses, joints), bone marrow. Affected tissues
Avibacterium paragallinarum (Infectious coryza)	PCR [HPG-1, HPG-2]	Sinus swabs, isolates
Gallibacterium anatis	PCR [*gyrB*]	Swabs from lesions, affected tissues
Clostridium Perfringens Type A	PCR [*netB, cpa* (alpha-toxin)]	Swabs of pseudomembranous lesions, intestinal contents, mucosal scrapings, hemorrhagic lymphoid nodules
Clostridium colinum	PCR [16S rRNA]	Swabs from lesions, affected tissues

*Dry swabs, avoid calcium alginate. Keep cool (4C) and ship as soon as possible.
Note: for Mycoplasma samples, pool up to 5 swabs for testing, for Campylobacter testing, pool

Molecular tests under development	
Histomonas meleagridis	PCR
Pasteurella multocida serotyping	PCR [LPS outer core biosynthesis loci]
Pasteurella multocida Vaccine specific PCR	PCR

NEW Molecular diagnostics for Infectious Bronchitis Virus (IBV) – real time RT-PCR

Holly Sellers
Department of Population Health, Poultry Diagnostic and Research Center, College of Veterinary Medicine, 953 College Station Road, University of Georgia, Athens, GA 30602, USA

The PDRC is pleased to announce we now offer validated IBV real time RT-PCR's on tracheal or choanal cleft swabs for the following Infectious Bronchitis Viruses:

Mass	Conn
GA13	Ark
GA07	DMV-1639
Del072/GA98 - primer/probe set detects both since they are genetically similar	
GA08 - test will detect both the Folds and classic GA08	

All samples submitted will be tested for IBV (+/-), along with the client's choice of 2 or 3 targets from the list above.

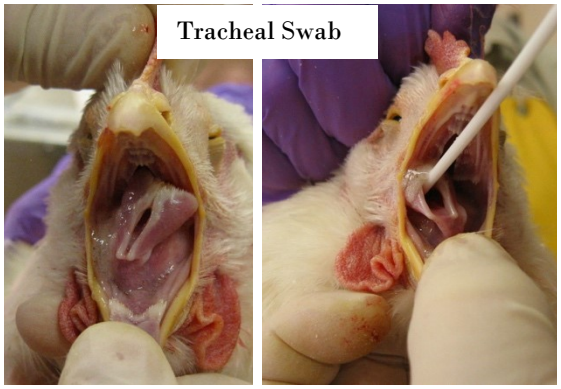
3 panel IBV: +/- rRT-PCR AND clients' choice of 2 IBV targets = $225
4 panel IBV: +/- rRT-PCR AND client's choice of 3 IBV targets = $275

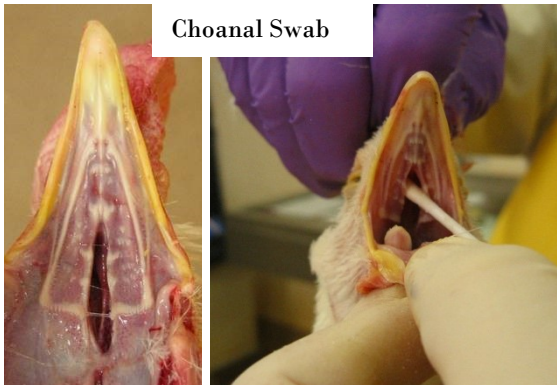
Additional targets, beyond the initial selection of 3 or 4 targets, can be requested at the time of submission for an additional $50 per target. Additional targets requested after submission and testing will incur an additional $100 per sample.

Please refer to the instructions on the next page for taking swabs.

Instructions for taking choanal (palatine) cleft swabs for IBV real time RT-PCR

It is best to have 2 people for swab collection. One person can hold the bird while the other person swabs the bird and places the swab in a tube.





Sampling materials are available for purchase at a cost of $1.50/swab+PBS tube plus shipping unless FEDEX account number provided.

Instructions continued on next page

Take swab samples from 25 birds in each flock. Pool 5 swabs in 1 tube of PBS.

1. Remove swab from wrapper, swab the choanal cleft palate and place swab in one tube.
2. Use scissors to cut stem of swab so that swab is below the cap line.
3. Be sure to keep cap on swab tubes in between swab collections to avoid contamination.
4. If pooling swabs, collect and place 5 swabs per tube, snap the cap completely closed.
5. Place tubes back on ice after collection.
6. Repeat steps 1-5 for each flock.
7. Samples can be placed in the refrigerator (4°C) over night until shipping.
8. Place swab/tubes in ziplock bags to prevent leakage from the container.
9. Please include the PDRC accession form in the shipment box. Please add flock information and any additional emails for reports.
10. Ship on dry ice (preferable) or cold ice packs.

NOTE: If collecting swabs for mycoplasma, the procedure is the same, however swabs do not need to be placed into PBS tubes; they can remain dry (ie. Pool 5 swabs/sterile bag or similar container)

Be sure to keep swab tubes cold from the point of collection to shipment. Ship swabs in tubes **overnight express** on dry ice or cold ice packs to:

PDRC/UGA

953 College Station Rd.

Athens, GA 30602

Attn: Diagnostic lab

Excerpts from the latest USDA National Agricultural Statistics Service (NASS) "Broiler Hatchery," "Chicken and Eggs" and "Turkey Hatchery" Report and Economic Research Service (ERS) "Livestock, Dairy and Poultry Situation Outlook"

Chickens and Eggs

Released October 22, 2018, by NASS, Agricultural Statistics Board, USDA

September Egg Production Up 4 Percent

United States egg production totaled 8.91 billion during September 2018, up 4 percent from last year. Production included 7.76 billion table eggs, and 1.15 billion hatching eggs, of which 1.07 billion were broiler-type and 85.5 million were eggtype. The average number of layers during September 2018 totaled 386 million, up 3 percent from last year. September egg production per 100 layers was 2,309 eggs, up 1 percent from September 2017.

All layers in the United States on October 1, 2018 totaled 386 million, up 2 percent from last year. The 386 million layers consisted of 325 million layers producing table or market type eggs, 57.3 million layers producing broiler-type hatching eggs, and 3.47 million layers producing egg -type hatching eggs. Rate of lay per day on October 1, 2018, averaged 76.8 eggs per 100 layers, up 1 percent from October 1, 2017.

Egg-Type Chicks Hatched Up 16 Percent

Egg-type chicks hatched during September 2018 totaled 49.6 million, up 16 percent from September 2017. Eggs in incubators totaled 51.7 million on October 1, 2018, up 11 percent from a year ago.

Domestic placements of egg-type pullet chicks for future hatchery supply flocks by leading breeders totaled 188 thousand during September 2018, down 1 percent from September 2017.

Broiler-Type Chicks Hatched Down Slightly

Broiler-type chicks hatched during September 2018 totaled 787 million, down slightly from September 2017. Eggs in incubators totaled 649 million on October 1, 2018, down slightly from a year ago.

Leading breeders placed 8.33 million broiler-type pullet chicks for future domestic hatchery supply flocks during September 2018, up 1 percent from September 2017.

Broiler Hatchery

Released October 31, 2018, by NASS, Agricultural Statistics Board, USDA

Broiler-Type Eggs Set Down Slightly

Hatcheries in the United States weekly program set 219 million eggs in incubators during the week ending October 27, 2018, down slightly from a year ago. Average hatchability for chicks hatched during the week in the United States was 82.6 percent. Average hatchability is calculated by dividing chicks hatched during the week by eggs set three weeks earlier.

Broiler-Type Chicks Placed Down Slightly

Broiler growers in the United States weekly program placed 174 million chicks for meat production during the week ending October 27, 2018, down slightly from a year ago. Cumulative placements from the week ending January 6, 2018 through October 27, 2018 for the United States were 7.85 billion. Cumulative placements were up 1 percent from the same period a year earlier.

Turkey Hatchery

Released October 16, 2018, by the NASS, Agricultural Statistics Board, USDA

Eggs in Incubators on October 1 Up 1 Percent from Last Year

Turkey eggs in incubators on October 1, 2018, in the United States totaled 28.4 million, up 1 percent from October 1, 2017. Eggs in incubators were up 4 percent from the September 1, 2018 total of 27.4 million eggs.

Poults Hatched During September Down 5 Percent from Last Year

Turkey poults hatched during September 2018, in the United States totaled 22.4 million, down 5 percent from September 2017. Poults hatched were down 6 percent from the August 2018 total of 24.0 million poults.

Net Poults Placed During September Up Slightly from Last Year

The 20.7 million net poults placed during September 2018 in the United States were up slightly from the number placed during the same month a year earlier. Net poult placements were down 11 percent from the August 2018 total of 23.3 million.

Current Month Charts

Broiler Performance Data Live Production Cost	Region					Average Company
	SW	Midwest	Southeast	Mid-Atlantic	S-Central	
Feed Cost/ton w/o color ($)	250.08	222.82	243.54	248.31	242.28	244.92
Feed cost /lb meat (c)	20.35	18.67	21.49	22.00	20.11	20.54
Corn Price per Bushel	4.20	3.64	4.27	4.39	4.39	4.20
SBM price / ton	259.47	318.75	332.46	340.50	340.50	332.25
Age at harvest (days)	50.00	48.00	51.00	55.00	48.00	49.00
Days to 4.6 lbs	39.00	38.00	39.00	39.00	38.00	38.00
Chick cost / lb (c)	5.32	5.71	5.72	4.67	5.78	5.78
Vac-Med cost/lb (c)	0.06	0.03	0.09	0.09	0.06	0.08
WB & ½ parts condemn. Cost/lb	0.13	0.12	0.15	0.12	0.13	0.14
% mortality	4.66	4.73	6.46	5.06	**.**	**.**
Sq.Ft. @ placement	0.86	0.82	0.88	0.93	0.90	0.87
Lbs/sq. ft.	7.91	7.85	7.52	8.55	7.38	7.56
Downtime (days)	21.00	18.00	19.00	19.00	21.00	20.00
Broiler Whole Bird Condemnation			**Region**			**Average Company**
	SW	Midwest	Southeast	Mid-Atlantic	S-Central	
% Septox	0.124	0.148	0.117	0.143	0.063	0.128
% Airsac	0.025	0.053	0.043	0.038	0.016	0.039
% I.P.	0.007	0.032	0.011	0.022	0.004	0.015
% Leukosis	0.000	0.013	0.000	0.000	0.000	0.002
% Bruises	0.001	0.001	0.006	0.002	0.002	0.002
% Other	0.014	0.003	0.019	0.010	0.056	0.022
% Total	0.171	0.251	0.196	0.215	0.140	0.171
% ½ parts condemns	0.196	0.102	0.204	0.129	0.252	0.196

Data for week ending Oct 20, 2018

Previous Month Charts

Broiler Performance Data Live Production Cost	Region					Average Company
	SW	Midwest	Southeast	Mid-Atlantic	S-Central	
Feed Cost/ton w/o color ($)	256.06	228.66	250.44	253.41	249.38	251.16
Feed cost /lb meat (c)	20.94	19.38	21.63	22.77	20.80	21.17
Corn Price per Bushel	4.23	3.70	4.34	4.44	4.20	4.25
SBM price / ton	337.18	322.76	339.46	349.26	337.89	339.75
Age at harvest (days)	50.00	49.00	48.00	55.00	48.00	49.00
Days to 4.6 lbs	39.00	39.00	38.00	39.00	38.00	39.00
Chick cost / lb (c)	5.38	5.69	5.79	4.88	5.72	5.83
Vac-Med cost/lb (c)	0.07	0.03	0.09	0.08	0.08	0.09
WB & ½ parts condemn. Cost/lb	0.13	0.12	0.13	0.14	0.14	0.14
% mortality	4.87	5.36	4.50	5.15	**.**	**.**
Sq.Ft. @ placement	0.86	0.82	0.88	0.92	0.89	0.87
Lbs/sq. ft.	7.86	7.84	7.34	8.34	7.35	7.46
Downtime (days)	19.00	17.00	19.00	19.00	19.00	19.00
Broiler Whole Bird Condemnation			**Region**			**Average Company**
	SW	Midwest	Southeast	Mid-Atlantic	S-Central	
% Septox	0.117	0.151	0.095	0.155	0.060	0.119
% Airsac	0.027	0.048	0.028	0.052	0.014	0.037
% I.P.	0.007	0.017	0.007	0.032	0.005	0.013
% Leukosis	0.000	0.002	0.000	0.000	0.000	0.000
% Bruises	0.001	0.001	0.004	0.002	0.002	0.002
% Other	0.015	0.004	0.018	0.010	0.067	0.027
% Total	0.166	0.222	0.152	0.251	0.168	0.199
% ½ parts condemns	0.198	0.110	0.184	0.148	0.237	0.175

Data for week ending Sep 22, 2018

PDRC Updates

Clinical Poultry Veterinarian Wanted

The Department of Population Health, Poultry Diagnostic and Research Center (PDRC), College of Veterinary Medicine at the University of Georgia is seeking a veterinarian to fill a position in clinical poultry medicine. Requirements include a DVM degree or equivalents, such as a VMD or BVS, and board certification (or eligibility for examination) by the American College of Poultry Veterinarians. Responsibilities include clinical services to the poultry industry and major participation in instruction in the Master of Avian Medicine and the online Master of Avian Health and Medicine degree programs. This position will be either a non-tenure track clinical professorship or a tenure track professorship depending upon qualifications. The University of Georgia is an Equal Opportunity/Affirmative Action employer. **This position is open for applications until February 1, 2019**. Interested persons should contact Dr. Mark Jackwood (mjackwoo@uga.edu) or Dr. Karen Grogan (kbgrogan@uga.edu). For information on the application process please contact Tracey Collett (tracey86@uga.edu). Information about PDRC can be found here https://vet.uga.edu/pdrc

Labtrak Update

A new version of Labtrak, the database and report generating software that is used to provide results to our clients, was launched on August 6, 2018. You may have noticed the formatting on reports has changed slightly. Please bear with us as we work out any bugs that have been encountered. Clients experiencing any issues or who have questions are encouraged to contact the diagnostic lab (706-542-5657 or pdrc@uga.edu)

Meetings, Seminars and Conventions

November 2018

November 5-7
Poultry Tech Summit
Atlanta, GA, USA
https://www.wattglobalmedia.com/poultrytechsummit/

November 6-8
2018 PSA Latin American Scientific Conference
Sao Paula, Brazil
https://www.poultryscience.org/latin18/

November 13-16
Eurotier Hannover 2018
Hanover, Germany
https://www.eurotier.com/en/

December 2018

December 11-12
National Poultry Symposium on Health & Welfare
Rawalpindi, Pakistan
http://www.wpsa.com/index.php/calendar-home/calendar/68-national-poultry-symposium-on-health-welfare

February 2019

February 12-14
International Production & Processing Expo (IPPE)
Atlanta, GA, USA
http://www.ippexpo.org/

Reminder

All previous issues of the Poultry informed Professional are archived at:

https://vet.uga.edu/pdrc/pip