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RECOGNITION OF A NEW CLINICAL PRESENTATION OF ILTV

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INTRODUCTION

Within the past year, clinicians at the University of Georgia Poultry Diagnostic and Research Center (PDRC) have recognized a mild form of Infectious laryngotracheitis virus (ILTV), "Silent LT." First identified during the winter of 2001, Silent LT was localized to Northeast Georgia, but positive identification has been made in other broiler production areas in the Southeast (pers. Comm., Glisson, 2002)

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Broiler Performance Data (Region) Live Production Cost					
	SW	Midwest	Southeast	Mid-Atlantic	S-Central
Feed cost/ton w/o color (\$)	142.74	132.70	149.70	150.09	146.04
Feed cost/lb meat (¢)	13.28	12.26	13.95	14.60	13.66
Days to 4.6 lbs	44	43	43	44	43
Chick cost/lb (¢)	4.08	3.97	4.14	3.81	4.05
Vac-Med cost/lb (¢)	0.07	0.03	0.08	0.04	0.04
WB & 1/2 parts condemn. cost/lb	0.26	0.24	0.15	0.25	0.21
% mortality	5.34	4.99	4.54	5.28	4.93
Sq. Ft. @ placement	0.75	0.75	0.79	0.78	0.79
Lbs./Sq. Ft.	7.02	7.13	6.95	7.23	6.85
Down time (days)	17	16	15	17	17

Data for week ending 02/15/03

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ILTV is a severe respiratory pathogen of chickens. An alpha-herpes virus, this disease is characterized by acute respiratory mortality and egg production losses. Clinical signs of severe outbreaks include gasping, expectoration of bloody mucus and severe depression. Birds exposed naturally will develop clinical signs in 6-12 days, with a duration of 10-14 days depending on severity of the infection. On necropsy, lesions can include conjunctivitis, laryngitis; and, most classically, a hemorrhagic mucoid tracheitis.

Confirmatory diagnosis is obtained through histopathology, finding syncytial cells with type A intranuclear inclusion bodies. Virus isolation is performed on chorioallantoic membrane (CAM) surface of 9-12 day old embryos, with detection of pocks six days later in positive samples. The CAM must then be submitted for histopathology to distinguish lesions from those created by pox viruses. Other diagnostic tools available for diagnosis include a fluorescent antibody procedure, immunoperoxidase procedure, ELISA, electron microscopy, DNA hybridization and PCR (1, 2).

Common preventative measures include vaccination with both chicken embryo (CEO) and tissue culture origin (TCO) vaccines. Vaccines are typically administered to long-lived breeder and layer type birds by eyedrop. Broilers are only vaccinated in outbreak situations to prevent the spread of epizootic disease within a control zone. New technologies have developed recombinant vaccines that incorporate ILTV genes into a vector virus that is either HVT virus or most recently a fowl pox virus. These recombinant products have increased efficacy over tissue culture but without the spreading effects of chick embryo vaccines. However, with these vaccines, each bird must be successfully vaccinated and must have no immunity to the vector virus.

Since ILTV is a herpes virus, it is known to establish a carrier state and can remain latent in infected birds. Birds that recover from acute infections will intermittently shed the virus for an unknown period of time without apparent clinical signs (2,4,6).

Virus can be recovered on swabs of the trachea and oropharynx. The recovered latent viruses have been proven to cause clinical signs in challenged birds (6).

HISTORY

Initial cases of “Silent LT” presented with swollen heads and pneumonia, typical of severe IBV infections in clinicians’ past experiences. Histopathology revealed few intranuclear inclusion bodies, and syncytia on conjunctiva and trachea of some of the affected broilers. Virus isolation and nested PCR for the transmembrane glycoprotein E (gly E) later proved to be positive for ILTV in these initial cases. The name “Silent LT” was assigned to this atypical presentation of the well-known disease.

With positive confirmation of ILTV and without the classic clinical signs of ILTV, the clinicians requested



Figure 1 - Almond shaped eye

Broiler Whole Bird Condemnation (Region)

	SW	Mid-West	S. East	Mid-Atlantic	S. Central
% Septox	0.353	0.403	0.164	0.331	0.233
% Airsac	0.170	0.177	0.128	0.171	0.191
% I.P.	0.055	0.031	0.048	0.052	0.114
% Leukosis	0.002	0.004	0.001	0.007	0.002
% Bruise	0.009	0.007	0.011	0.009	0.010
% Other	0.031	0.008	0.022	0.008	0.014
% Total	0.620	0.629	0.373	0.578	0.465
% 1/2 parts condemnations	0.447	0.403	0.263	0.416	0.433

Data for week ending 02/15/03

**Broiler Performance Data (Company)
Live Production Cost**

	Average Co.	Top 25%
Feed cost/ton w/o color (\$)	146.24	137.75
Feed cost/lb meat (¢)	13.67	12.35
Days to 4.6 lbs	44	43
Chick cost/lb (¢)	4.17	3.75
Vac-Med cost/lb (¢)	0.05	0.02
WB & 1/2 parts condemn. cost/lb	0.22	0.12
% mortality	4.96	4.22
Sq. Ft. @ placement	0.77	0.74
Lbs./Sq. Ft.	6.88	6.81
Down time (days)	16	16

Data for week ending 02/15/03



Figure 2 - Conjunctivitis

other local broiler companies to submit samples to allow a survey of the prevalence of the suspected condition. Of the three companies surveyed, a majority of broiler farms were positive by virus isolation or nested PCR.

CLINICAL SIGNS

Further investigation determined a clear clinical picture for this variation of ILTV. Birds will typically have a foamy conjunctivitis with variable facial swelling around the eye, giving an almond shape to the eye (Figures 1, 2, 3). Mild wet rales can be present, indicative of the catarrhal tracheitis (Figure 4) that is characteristic for this presentation. In complicated cases, a pneumonia and cranial airsacculitis, typically unilateral, may be present as well. Overall, this is a very mild disease with clinical signs that can be overlooked, as they are similar to other respiratory viruses such as IBV and NDV.

INVESTIGATION OF THE CAUSATIVE AGENT

Initial suspect cases were identified by histopathology with confirmation by other diagnostic tools. Isolation of a suspect virus on CAMs was confirmed by histopathology and immunohistochemistry. The nested PCR for gly E of ILTV on these cases were also positive.

To confirm the etiologic agent in question, a small initial trial was initiated at PDRC to confirm the existence of ILTV in these cases. Tracheal scrapings from suspected cases of "Silent LT" were inoculated into CAMs. Homogenates of histopathologically positive CAMs were inoculated into SPF layer pullets. Tracheal scrapings of those inoculated birds were tested by gly E and DNA polymerase PCR. DNA sequence identity performed on four out of seven samples resulted in 100% homology to ILT sequences.

A similar trial was also conducted with three clinical cases that were confirmed positive by CAM inoculation, immunohistochemistry of the CAM and nested PCR. The findings are summarized in Table 1.

From the results of this brief trial, researchers learned that the virus is of very low virulence. Despite the virus being detected by PCR, virus isolation and IHC were unable to detect the virus in this trial. The virus may not replicate to numbers high enough to be detected by those systems.

Furthermore, researchers theorized the virulence of the virus and its ability to replicate may be diminished when passed into SPF birds or the virus requires some insult to the trachea. There is still no clear reason for this phenomenon.

The nested PCR used in these investigations was developed by Dr. Maricarmen Garcia to examine ILTV viruses. In previous work, she used this technique to examine ILTV vaccines, and a collaborator used the same technique to examine formalin fixed tissues previously diagnosed as ILTV and other cases that were diagnosed as nonspecific tracheitis (3, 5).

The nested PCR amplifies a portion of the transmembrane glycoprotein E gene of ILTV. Two sets of primers are used, one outer and one inner, to produce a 296 bp product. The sensitivity of this procedure is estimated at 500 to 50 femtograms (5). The glycoprotein E primers are highly specific for ILTV, as there are no positive PCR products when the primers are used on other viruses such as Marek's, adenoviruses, CAV, and fowl pox (5).

Another set of nested primers has been developed to amplify a conserved region of the DNA polymerase segment of herpesviruses. This additional tool was also used to further examine these suspected samples

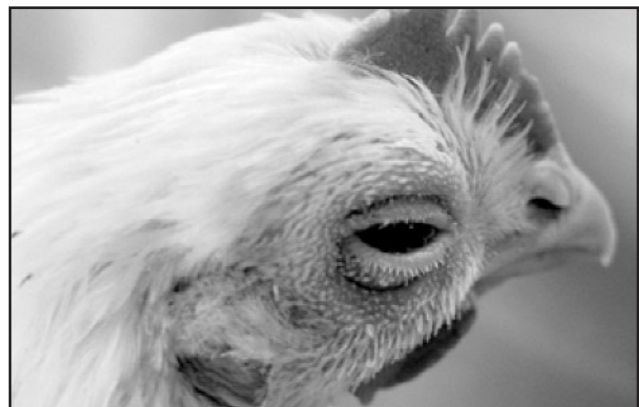


Figure 3 - Facial Swelling

Table 1 - Inoculation of 3-week-old SPF chickens with CAM homogenates from three broiler diagnostic lab cases.

Case No.	Clinical Signs 3.d.p.i.*	Nested PCR		Virus Isolation 7 d.p.i.	Histo IHC** 7 d.p.i.
		3 d.p.i.	7 d.p.i.		
18089	4/12	1/5	9/14	Negative	Negative
18937	0/12	0/4	7/13	Negative	Negative
20402	6/12	2/14	3/14	Negative	Negative

* d.p.i. - days post inoculation ** IHC - Immunohistochemistry

for the presence of ILTV. By sequencing the PCR products of both types of nested PCR, 100 percent homology to ILTV was determined.

Using clinical case samples, the product of the glycoprotein E PCR was analyzed using RFLP. This same technique was used to analyze the viral subpopulations in CEO and TCO vaccines (3). Using two separate restriction enzymes, EaeI and DdeI, several RFLP patterns resulted from each vaccine type (3). Looking at the “Silent LT” clinical cases, the PCR products were digested using the DdeI enzyme only. The electrophoretic pattern is identical to the Pattern B that was found as a subpopulation of CEO vaccines (Figure 5).

DIAGNOSIS OF CLINICAL CASES

Diagnosis of “Silent LT” must encompass several diagnostic and laboratory tools. First is a complete necropsy to identify gross lesions, collecting samples for histopathology and virus isolation, including conjunctiva, trachea and lung. The pathologist will attempt to locate the scant intranuclear inclusions and syncytial cells, as they are not as numerous with this type of infection. Virus isolation attempts on CAMs can be difficult, as the virus seems to be particularly challenging to grow and maintain in propagation systems.

Unlike other ILTV, this virus grows poorly in embryos and has not been found to grow in tissue culture or cell line systems. Traditional pock formation is rarely observed; however, when present, they are smaller than classical ILTV pocks. Histopathology of the CAM reveals syncytial cells and intranuclear inclusion bodies. Virus isolation materials can be tested for presence of ILTV using PCR-RFLP or IHC.

ATTEMPTS AT CONTROL

When researchers understood that ILTV was involved in this disease, the focus then turned on how to deal with it and the possible implications. Vaccination was not an option as the reaction to

improperly administered vaccines would be worse than the “Silent LT.” Control mechanisms would have to involve biosecurity and clean out. were confirmed with the “Silent LT” virus by nested PCR within one company. One house was thoroughly cleaned out and was allowed three weeks downtime. The other house was heated to 100° F for 3 days and also had a three week downtime. Birds from both houses were again found to be positive for ILTV by nested PCR or immunohistochemistry during the subsequent growout. From this trial, researchers concluded that traditional control mechanisms did not seem to work with this variation of ILTV.

Additional management changes were installed in complexes that had numerous positive farms. Service personnel visits and feed delivery were scheduled to known positive farms at the end of the day or all positive farms on the same day. Since the broiler companies were also trying to control GA 98 IBV at the same time with vaccination with ARK and DE 072, they were advised to minimize their vaccination programs in an attempt to reduce tracheal damage by the vaccines. It was felt that these severe vaccine reactions may have been a contributing factor to the clinical signs of “Silent LT.” By changing to milder Newcastle vaccines and reducing the per bird titer of the IBV vaccines, many companies are reporting a

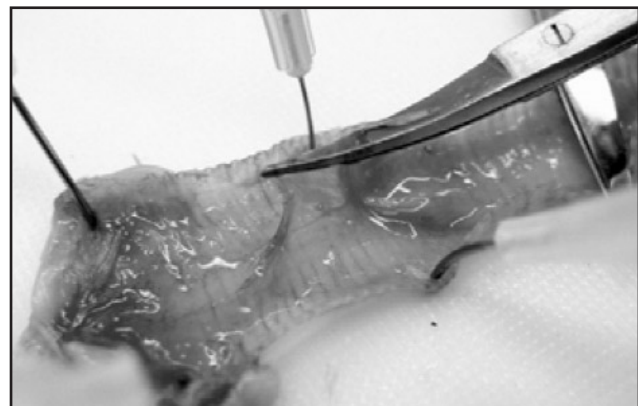


Figure 4 Tracheitis

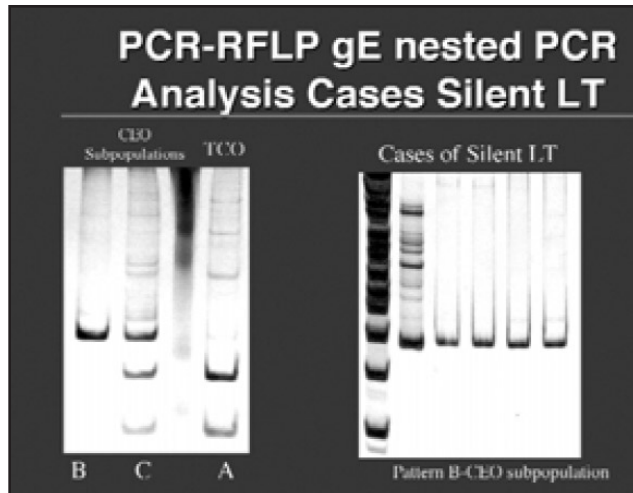


Figure 5 - Electrophoretic patterns of ILTV vaccines as compared to "Silent LT" cases.

reduction in the number of farms with clinical signs.

CURRENT STATUS AND CONTINUING RESEARCH

The submission frequency has been on a steady decline since the discovery of "Silent LT." With further understanding of the characteristics of the virus, the mild clinical signs and the apparent low virulence of the virus, the majority of broiler companies have adapted to the presence of the virus. In complicated situations, it appears the virus may play a role in a multifactorial respiratory disease along with immunosuppressive factors and other respiratory viruses.

Research continues on the virus at the University of Georgia PDRC. Further projects are in progress to determine the best diagnostic tools to detect the presence of Silent LT, comparing histopathology, nested PCR, and IHC. An examination of the utility of a DNA probe/DNA hybridization on tissues is planned in the future to find a more rapid diagnostic test.

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Silent LT clinical information is based on a presentation by Dr. John Glisson, Dr. Holly Sellers and Dr. Maricarmen Garcia "Silent ILT" presented at Georgia Veterinary Medical Association Annual Meeting, Poultry Section, June 2002, and the author's personal experience during the MAM program.

FOR YOUR INFORMATION

Bayer has launched a website that will keep you informed of the Notice of Opportunity of Hearing proceedings with FDA to withdraw Baytril from the U.S. market. The site gives the science behind Bayer's defence of Baytril as a tool in poultry production. It will be continually up-dated. The address is www.healthypoultry.com

REMINDER

All previous issues of the Poultry Informed Professional are archived on our website www.avian.uga.edu under the Online Documents and The Poultry Informed Professional links.

**Broiler Whole Bird Condemnation
(Company)**

	Average Co.	Top 25%
% Septox	0.294	0.235
% Airsac	0.139	0.084
% I.P.	0.068	0.022
% Leukosis	0.004	0.004
% Bruise	0.010	0.010
% Other	0.015	0.005
% Total	0.530	0.359
% 1/2 parts condemnations	0.397	0.165

Data for week ending 02/15/03



The University of Georgia is committed to the principle of affirmative action and shall not discriminate against otherwise qualified persons on the basis of race, color, religion, national origin, sex, age, physical or mental handicap, disability, or veteran's status in its recruitment, admissions, employment, facility and program accessibility, or services.

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

Broiler Eggs Set in 19 Selected States Down 4 Percent

According to the latest National Agricultural Statistics Service (NASS) reports, commercial hatcheries in the 19-State weekly program set 204 million eggs in incubators during the week ending February 22, 2003. This was down 4 percent from the eggs set the corresponding week a year earlier. Average hatchability for chicks hatched during the week was 83 percent. Average hatchability is calculated by dividing chicks hatched during the week by eggs set three weeks earlier.

Broiler Chicks Placed Down 3 Percent

Broiler growers in the 19-State weekly program placed 165 million chicks for meat production during the week ending February 22, 2003. Placements were down 3 percent from the comparable week a year earlier. Cumulative placements from December 29, 2002 through February 22, 2003 were 1.32 billion, down 2 percent from the same period a year earlier.

January Egg Production Up 1 Percent

U.S. egg production totaled 7.34 billion during January 2003, up 1 percent from last year. Production included 6.25 billion table eggs and 1.08 billion hatching eggs, of which 1.02 billion were broiler-type and 64.0 million were egg-type. The total number of layers during January 2003 averaged 338 million, down slightly from a year earlier. January egg production per 100 layers was 2,170 eggs, compared to 2,143 eggs in January 2002.

All layers in the U.S. on February 1, 2003, totaled 339 million, up slightly from a year ago. The 339 million layers consisted of 279 million layers producing table type eggs, 56.3 million layers producing broiler-type hatching eggs, and 2.71 million layers producing egg-type hatching eggs. Rate of lay per day on February 1, 2003, averaged 70.1 eggs per 100 layers, up 2 percent from a year ago.

Laying flocks in the 30 major egg producing States produced 6.86 billion eggs during January 2003, up 1 percent from a year ago. The average number of layers during January, at 316 million, was down 1 percent from a year ago.

Egg-Type Chicks Hatched Down 6 Percent

Egg-type chicks hatched during January totaled 33.5 million, down 6 percent from January 2002. Eggs in incubators totaled 27.5 million on February 1, 2003, down 14 percent from a year ago.

Domestic placements of egg-type pullet chicks for future hatchery supply flocks by leading breeders totaled 198,000

during January 2003, down 13 percent from January 2002.

Broiler Hatch Down 2 Percent

The January 2003 hatch of broiler-type chicks, at 760 million, was down 2 percent from January of the previous year. There were 630 million eggs in incubators on February 1, 2003, down 1 percent from a year earlier.

Leading breeders placed 6.3 million broiler-type pullet chicks for future domestic hatchery supply flocks during January 2003, down 6 percent from January 2002.

Turkey Eggs in Incubators on February 1 Down 4 Percent

Turkey eggs in incubators on February 1, 2003, in the United States totaled 30.7 million, down 4 percent from February 1 a year ago. Eggs in incubators were slightly below the January 1 total of 30.8 million. Regional changes from the previous year were: East North Central, down 3 percent; West North Central, down 1 percent; North and South Atlantic, down 3 percent; South Central, down 18 percent; and West, down 6 percent.

Poults Placed During January Down 2 Percent From Last Year

The 25.4 million poults placed during January 2003 in the United States were down 2 percent from the number placed during the same month a year ago. Placements were up 6 percent from the December 2002 total of 24.0 million. Regional changes from the previous year were: East North Central, up 2 percent; West North Central, up 2 percent; North and South Atlantic, down 6 percent; South Central, down 20 percent; and West, up 17 percent.

Trade and Disease Issues Dominate Poultry Industry

According to the latest Economic Research Service (ERS) reports, Trade and Disease Issues Dominate Poultry Industry. There are currently a number of trade and disease issues affecting the U.S. poultry industry. How these issues are resolved could have an impact on both short-term and long-term outlooks especially regarding poultry shipments to Russia, China, and Mexico, the three largest U.S. poultry export markets.

- Russia has indicated that it will place a quota on total poultry imports starting around May 1, 2003. The quota is expected to be 744,000 metric tons, with 553,500 metric tons allocated to the United States. Over the 8-month period of the quota this would average out to 152.5 million pounds a month, almost 20 million pounds above average U.S. poultry shipments to Russia during the first 11 months of 2002. However, this is

almost 40 million pounds a month less than in 2001, when the U.S. shipped a record 2.3 billion pounds of broiler products to Russia, 192 million pounds a month. In 2004, the overall Russian import quota will be approximately 1 million metric tons. If the U.S. receives the same percentage of the quota as in 2003, then U.S. exports to Russia would be around 780,000 metric tons, or 143 million pounds per month. The stated purposes of the quota are to protect Russia's domestic poultry industry and to encourage its expansion. The quotas are for all poultry product imports, so shipments of turkey products would also count as part of the quota.

- Russia is also in the process of certifying which U.S. poultry processing plants will be allowed to continue to export there. At some point, broiler products from plants without this certification will be disallowed. To date, only a small number of U.S. plants have passed this certification process.

- As of January 1, 2003, under the North American Free Trade Agreement (NAFTA), all quotas and tariffs on U.S. poultry products exported to Mexico were phased out. However, Mexico has placed a tariff-rate quota (TRQ) on the importation of U.S. broiler leg quarters, thighs, and drumsticks. Imports over the quota will incur a 98.8-percent tariff. Presently, the TRQ is for 6 months only, and there has been no official announcement about subsequent TRQ levels. Shipments of turkey products to Mexico, the largest U.S. export market, have not been affected and will have no quotas or tariffs.

- Currently, there are ongoing discussions with the Chinese government regarding changes in poultry labeling requirements. China insists on bilingual labels directly on shipping containers and on plastic inner liners. China has placed a deadline of April 1, 2003, on this new requirement, after which shipments without the correct labeling will be refused entry.

- Exotic Newcastle disease (END) has been detected in Southern California and parts of Nevada and Arizona. END does not affect humans, but is highly contagious and deadly among poultry. So far, the disease has been confined to non-commercial flocks in Nevada and Arizona. In Southern California, commercial egg-laying flocks have been affected and over 2 million birds (less than 1 percent of the total U.S. domestic egg-laying flock) have been destroyed.

- As a result of the END outbreak, many countries have banned poultry and egg product imports from the affected States. A number of States have also placed restrictions on shipments of live birds, including game birds and pet birds, from the affected areas.

Broiler Production Expected Lower in First-Half 2003

The low prices and uncertain export environment that prevailed for broilers during much of 2002 has continued into 2003. Broiler production for the first half of 2003 is expected to be down slightly from a year earlier as producers react to low prices and export uncertainties. This is the first time that federally inspected broiler production has fallen in two consecutive quarters since 1975. The expectation is that smaller production will eventually reduce the large supplies of frozen broiler products currently overhanging the market, and unless further trade issues develop, exports in 2003 are expected to exceed those of 2002. The combination of lower broiler production and improving trade, along with lower competing meat supplies, are expected to gradually strengthen broiler prices in the second half of 2003. By the second half, produc-

tion is expected to be increasing, rising 3.3 percent in the fourth quarter compared with the previous year.

U.S. broiler meat production for 2002 on a ready-to-cook (RTC) basis was 32.3 billion pounds, 3.3 percent higher than in 2001. The increase in production was due to a 1.6-percent increase in the number of birds being slaughtered and a 1.4-percent increase in the average weight of broilers at slaughter. During the fourth quarter of 2002, broiler integrators slowed production in response to low prices in the domestic market and low prices for exported products due to uncertain access to the Russian market, by far the largest for the U.S. During the fourth quarter of 2002, production was 7.94 billion pounds, only 1 percent above the same period in 2001. The number of birds processed in the fourth quarter actually was down 0.2 percent, and only an increase of 1.6 percent in average slaughter weights pushed broiler production higher.

Turkey Production Seen as Flat in 2003

Turkey production in 2003 is forecast at 5.7 billion pounds, up only marginally from the previous year. With large stocks of turkey products at the beginning of the year and no growth expected in domestic per capita consumption or exports, turkey prices are expected to be relatively flat in 2003, especially for turkey parts.

Turkey production in 2002 paralleled broiler production. RTC production totaled 5.7 billion pounds, up 2.8 percent from the previous year. Like broilers, turkey production slowed in the second half, with production only 1.3 percent higher than the previous year (as opposed to 4.4 percent higher in the first half of the year). An outbreak of avian influenza in some turkey production areas earlier last year was originally expected to increase prices, but the number of birds affected was too small to effect prices on a national level. Prices for whole birds in 2002 averaged 64.5 cents per pound, down 2.8 percent from the previous year. Prices for turkey parts were also lower, with prices for turkey breasts down 4.1 percent and wing prices 25 percent lower.

Little Growth Expected in Egg Production

Egg production for consumption and for hatching is expected to be basically flat in 2003. This slowdown in the availability of eggs for consumption is expected to result in higher wholesale prices. Two major issues are expected to affect the demand for eggs. First, a slower economy is expected to lower the demand for breaking eggs, which has been a growing component of table egg demand. Second, U.S. exports of eggs in 2003 are forecast to be only 77 percent of what they were 5 years earlier as domestic production rises in other countries. This reduction in exports has left more eggs for consumption in the domestic market.

Egg production in 2002 was 7.22 billion dozen, with 85 percent of that coming from table egg production and the remainder from hatching egg production. Hatching egg production was down slightly from the previous year, mostly due to the slowdown in broiler industry growth. Production of eggs for consumption was also relatively flat, increasing only 1.1 percent. One growth area in the egg industry was in the number of eggs broken for restaurant and bakery use. Breaking egg use in 2002 totaled 1.9 billion dozen, or 31 percent of total egg consumption.

Meetings, Seminars and Conventions

2003 March

March 19-20: *U.S. Poultry Feed Mill Management*, DoubleTree Hotel, Nashville, TN. Contact: U.S. Poultry & Egg Association, 1530 Cooleedge Road, Tucker, GA 30084-7303. Phone 770-493-9401; <http://www.poultryegg.org>

March 26-27: *North Atlantic Poultry Health and Management Conference*, Portsmouth Sheraton, Portsmouth, New Hampshire. Contact: William Bell, New England Poultry Association, P.O. Box 152, Hallowell, ME 04347. Phone: (207) 622-3940; Fax: (207) 623-3748, Email: newengag@mint.net

2003 April

April 4-5: *Florida Poultry Days*, Orlando, FL. Contact: Florida Poultry Association, 4508 Oak Fair Blvd., No. 290, Tampa, FL 33601

April 20-23: *Middle East Poultry Show*, Dubai World Trade Center Exhibition Complex, United Arab Emirates. Contact: Mediac Communication and Promotion, P.O. Box 5196, Dubai, UAE. Phone: +971 4 2692004; Fax: +971 4 2691298

April 28-30: *U.S. Poultry Human Resources Management*, Park Vista Hotel, Gatlinburg, TN. Contact: U.S. Poultry & Egg Association, 1530 Cooleedge Road, Tucker, GA 30084-7303. Phone 770-493-9401; <http://www.poultryegg.org>

2003 May

May 1-4: *GPF Annual Meeting*, Brasstown Valley Resort, Young Harris, GA. Contact: Georgia Poultry Federation, P.O. Box 763, Gainesville, GA 30503. Phone: 770-532-0473; claudette@gapf.org

May 8-9: *U.S. Poultry National Breeders Roundtable*, Airport Marriott Hotel, St. Louis, MO. Contact: U.S. Poultry & Egg Association, 1530 Cooleedge Road, Tucker, GA 30084-7303. Phone: 770-493-9401; <http://www.poultryegg.org>

May 11-14: *Alltech International Feed Industry Symposium*, Lexington, Kentucky. Contact: Roel Coenders, Phone: 859-887-3244; Email: rcoenders@alltech.com

May 14-15: *U.S. Poultry Processor Workshop*, DoubleTree Hotel, Nashville, TN. Contact: U.S. Poultry & Egg Association, 1530 Cooleedge Road, Tucker, GA 30084-7303. Phone: 770-493-9401; <http://www.poultryegg.org>

May 17: *GPF Night of Knights*, Cobb Galleria Centre, Atlanta, GA. Contact: Georgia Poultry Federation, P.O. Box 763, Gainesville, GA 30503. Phone: 770-532-0473; claudette@gapf.org

May 29-31: *Chicken Cooking Contest*, Baltimore Convention Center, Baltimore, MD. Contact: National Chicken Council, 1015 15th St., N.W., Suite 930, Washington, DC 20005-2625. Phone: 202-296-2622

May 29-June 1: *Georgia Veterinary Medical Association 2003 Annual Conference*, Sandestin Golf and Beach Resort, Florida. Reservations (800) 320-8115

2003 June

June 5-7: *VIV Poultry Yutav*, World Trade Center Yesulsky, Istanbul, Turkey. Contact: Jaabeurs Exhibitions and Media, P.O. Box 8800, 3503 RM Utrecht, The Netherlands. Phone: +31 30 295 2772; Fax: +31 30 295 2809

June 6-7: *The Poultry Federation's Festival*, Arlington Hotel, Hot Springs, AR. Contact: Judy Kimbrell, The Poultry Federation, P.O. Box 1446, Little Rock, AR 72203. Phone: 501-375-8131

June 11-13: *75th Annual Northeastern Conference on Avian Disease*, University of Maine, Orono, ME. Contact: H. Michael Opitz, 134 Hitchner Hall, University of Maine, Orono, ME 04469-5735, Phone: (207) 581-2771; Fax: (207) 581-2729; Email: mopitz@umext.maine.edu; Website: <http://www.umaine.edu/livestock/necad.htm>

June 14-16: *Agrena 2003*, 5th International Exhibition of Poultry & Livestock Production, Cairo International Conference Centre, Egypt. Contact: Crose Fairs Organisers, 87 El Alameen Street, Sahfeen, Mohandeseen, Cairo, Egypt. Phone/Fax: +20 2 30 38 994; Email: crose@access.com.eg; Website: www.agrena.com

June 16-18: *U.S. Poultry Financial Management*, Sawgrass Marriott Hotel, Ponte Vedra Beach, FL. Contact: U.S. Poultry & Egg Association, 1530 Cooleedge Road, Tucker, GA 30084-7303. Phone 770-493-9401; <http://www.poultryegg.org>

June 19-23: *140th AVMA Annual Convention*, Colorado Convention Center, Denver, Colorado. Contact: American Veterinary Medical Association, 1931 North Meacham Road, Suite 100, Schaumburg, IL 61073-4360. Phone: 847-925-8070; Fax: 847-925-9329; Email: avma.org; <http://www.avma.org>

June 20: *Delmarva Chicken Festival*, Dover, DE. Contact: Delmarva Poultry Industry, 16686 County Seat Highway, Georgetown, DE 19947. Phone: 302-856-9037; Fax: 302-856-1845; Email: dpi@dpickicken.com

June 25-27: *Georgia Egg Association's 42nd Annual Meeting*, King & Prince Hotel, St. Simons Island, GA. Contact: Robert Howell, Georgia Egg Commission, 16 Forest Park, GA 30297. Phone: 404-363-7661; Fax: 404-363-7664 or email: goodeggs@bellsouth.net

2003 July

July 15-16: *U.S. Poultry Hatcher-Breeder Clinic*, Marriott Marquis, Atlanta, GA. Contact: U.S. Poultry & Egg Association, 1530 Cooleedge Road, Tucker, GA 30084-7303. Phone 770-493-9401; <http://www.poultryegg.org>

July 19-23: *XIII Congress of the World Veterinary Poultry Association and the American Association of Avian Pathologists*, Denver, CO, USA. Contact: Details are posted on the web site of the American Association of Avian Pathologists. Website: <http://www.avian.uga.edu/~wvpa/>

July 28-30: *U.S. Poultry Information Systems*, Sawgrass Marriott Hotel, Ponte Vedra Beach, FL. Contact: U.S. Poultry & Egg Association, 1530 Cooleedge Road, Tucker, GA 30084-7303. Phone 770-493-9401; <http://www.poultryegg.org>

2003 August

Aug. 10-14: *14th European Symposium on Poultry Nutrition*, Lillehammer, Norway. Contact: Mrs. M.F. Bagley, Centre for Poultry Science, P.O. Box 4377, Nydalen, N-0402 Oslo, Norway. Phone: +47 22 79 87 73; Fax: +47 22 79 87 71; Email: wpsa@forfe.org; Website: www.wpsa.no

Aug. 21-23: *Livestock Asia 2003*, The Mines, Kuala Lumpur, Malaysia. Contact: Mr. Richard Yew, AMB Exhibitions Snd Bhd, Suite 1701, 17th Floor Plaza Permata, 6 Jalan Kampar, off Jalan Tun Razak, 50400 Kuala Lumpur, Malaysia. Phone: +603 4045 4993; Fax: +603 4045 4989; Email: info@ambexpo.com; Website: www.alliedmedia.org

Aug. 25-Feb. 27 2004: *International Course on Poultry Husbandry*, IPD Plant, Dier, Barneveld, the Netherlands. Deadline for Applications: April 1, 2003. Contact: IPC Plant, Dier Barneveld, Department of International Studies and Programmes, P.O. Box 64, 3770 AB Barneveld, the Netherlands. Phone: +31 342 406500; Fax: +31 342 406501; Email: barneveld@ipc-training.nl

2003 September

Sept 17-18: *U.S. Poultry Production & Health*, The Peabody Hotel, Memphis, TN. Contact: U.S. Poultry & Egg Association, 1530 Cooleedge Road, Tucker, GA 30084-7303. Phone 770-493-9401; <http://www.poultryegg.org>

Meetings, Seminars and Conventions

Sept 23-26: *XVI European Symposium on the Quality of Poultry Meat & European Symposium on the Quality of Eggs and Egg Products*, Saint-Brieve, Brittany, France. Contact: ISPAIA, Zoopole Development, BP7-22400 Ploufragan, France. Phone: +47 22 79 87 72, Fax: +47 22 79 87 71. Email: wpsa2003@zoopole2550.fr

2003 October

Oct 7-10: *XVIII Latin American Poultry Congress*, Hotel Los Tajibos, Santa Cruz, Bolivia. Contact: Casilla Postal 1133, Santa Cruz, Bolivia. Phone: 591-333-4807; Fax: 591-333-1528; Email: infomes@xviii-alabolivia.org

Oct 9-10: *U.S. Poultry Protein & Fat*, The Peabody Hotel, Memphis, TN. Contact: U.S. Poultry & Egg Association, 1530 Cooledge Road, Tucker, GA 30084-7303. Phone 770-493-9401; <http://www.poultryegg.org>

Oct. 11-15: *Anuga Food Show*, KslnMesse, Cologne, Germany. Contact: KslnMesse, GmbH, Messeplatz 1, D-50679 Kln, Germany. Phone: +49 821 33 05; Fax: +49 821 34 10. Email: m.schlvetter@koelnmesse.de

Oct. 22-24: *National Meeting on Poultry Health and Processing*, Clarion Resort Fontainebleau Hotel, Ocean City, Maryland. Contact: Karen Adams, Delmarva Poultry Industry, Inc., Phone (302)856-9037, Email: adams@dpichicken.com

Oct. 23-24: *U.S. Poultry Women in Management*, Park Vista Hotel, Gatlinburg, TN. Contact: U.S. Poultry & Egg Association, 1530 Cooledge Road, Tucker, GA 30084-7303. Phone 770-493-9401; <http://www.poultryegg.org>

Oct. 27: *Mycoplasma 2003*, NH Utrecht Hotel, Utrecht, The Netherlands. Contact: Positive Action Conferences, P.O. Box 4, Driffild, East Yorkshire, YO25 9DJ, England. Phone: +44 1377 256316; Fax: +44 1377 253640.

Email: conf@positiveaction.co.uk
Website: www.positiveaction.co.uk

Oct. 28-31: *VIV Europe 2003*, Jaarbeurs-venure, Utrecht, the Netherlands. Contact: Jaarbeurs Exhibitions & Media, P.O. Box 8800, 3503 RM utrecht, the Netherlands. Phone: +31 30 295 27 72; Fax: +31 30 295 28 09; Email: viv.europe@jem.nl

2003 November

Nov. 12: *U.S. Poultry Grain Forecast and Economic Outlook*, Atlanta Airport Hilton Hotel, Atlanta, GA. Contact: U.S. Poultry & Egg Association, 1530 Cooledge Road, Tucker, GA 30084-7303. Phone 770-493-9401; <http://www.poultryegg.org>

2004 January

Jan 28-30: *2004 International Poultry Exposition*, Georgia World Congress Center, Atlanta, GA. Contact: US Poultry & Egg Association, 1530 Cooledge Road, Tucker, GA 30084. Phone: 770-493-9401; Fax: 770-493-9527.

2004 March

Mar. 10-11: *Nebraska Poultry Industries Annual Convention*, New World Inn & Conference Center, Columbus, Nebraska. Contact: Nebraska Poultry Industries, Inc., University of Nebraska, A103 Animal Sciences, P.O. Box 830908, Lincoln, NE 68583-0908. Phone: 402-472-2051.

2004 April

Apr. 21-23: *VIV China*, Beijing, China, China International Exhibition Center. Contact: CNAVS Trade Fair Office, c/o Beijing Tech convention & Exhibition Center, Rm 3011, Yuanliwuye Building, No. 23, Hui Xin East Road, Beijing 100029-P.R. China. Phone: +86 10 649 88 358; Fax: +86 10 649 50 374 or Email: fair@public.east.cn.net

2004 June

June 8-12: *XXII World's Poultry Congress*, WPSA Turkish Branch, Istanbul, Turkey. Contact: congress Organiser: ITU Joint Venture, Cumhuriyet Cad. 18/5, 80230 Elmadag, Istanbul, Turkey. Phone: +90 212 231 3021; Fax: +90 212 232 1522; Email: wpsa2004@wpsa2004.org

June 16-19: *5th International Symposium on Turkey Diseases*, Berlin, Germany. Contact: Prof. Dr. H.M. Hafez, Institute of Poultry Diseases, Free University Berlin, Koserstrasse 21, 14195 Berlin, Germany. Phone: 49-30-8385-3862; Fax: 49-30-8385-5824; Email: hafez@zedat.fu-berlin.de