Issue 51 July 2001

The Poultry Informed Professional

1785

Published by the Department of Avian Medicine, University of Georgia
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Use of Phytase in Broiler Breeder Feeds

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Excess phosphorus in poultry waste presents an economic and environmental problem for the poultry industry. Technologies to reduce the phosphorus content of poultry waste are needed to address this problem. The efficacy of phytase in improving phytate phosphorus utilization in poultry feeds and reducing phosphorus waste have been demonstrated in a large number of research trials involving commercial layers and broilers. Adoption of phytase use by the broiler, layer, and swine industries also serves as evidence of the efficacy of phytase. However, broiler breeders, in addition to the requirements for growth and maintenance, must produce fertile, hatchable eggs, Until now, there have been no studies of phytase use in breeder feeds. The purpose of this study was to determine whether broiler breeders would respond to microbial phytase in a manner similar to broilers and commercial layers.

Continued on Page 2

Broiler Performance Data (Region)
Live Production Cost

	SW	Midwest	Southeast	Mid-Atlantic	S-Central
Feed cost/ton w/o color ($)	124.88	117.67	130.94	130.55	131.11
Feed cost/lb meat (¢)	11.84	11.20	12.35	12.81	12.19
Days to 4.6 lbs	45	44	44	44	43
Med. cost/ton (¢)	N/A	N/A	N/A	N/A	N/A
Chick cost/lb (¢)	4.07	3.78	3.75	3.53	3.91
Vac-Med cost/lb (¢)	0.05	0.02	0.11	0.05	0.09
WB & 1/2 parts condemn. cost/lb	0.22	0.18	0.20	0.21	0.18
% mortality	4.84	3.58	4.46	4.48	3.78
Sq. Ft. @ placement	0.81	0.79	0.83	0.81	0.82
Lbs./Sq. Ft.	6.05	6.57	6.61	7.01	6.36
Down time (days)	11	11	13	13	15

Data for week ending 6/09/01 N/A =Not Available

Contents

Breeder hens were reared to 21 weeks of age in a commercial pullet house. The pullets were transferred to a slat/litter breeder house at the Poultry Research unit, Auburn University where they were randomly assigned to one of 16 pens — 80 hens, and 8 males per pen. Pens, in groups of four, were assigned to one of two treatments. The control treatment contained a typical industry level of available phosphorus (0.80%). The phytase treatment was formulated to contain 0.10% available phosphorus with phytase added to provide 300 PTU/kg feed. In both treatments, calcium levels were maintained at 2.75%. Roosters were fed a common feed for both treatments. The birds were fed according to primary breeder recommendations. Criteria used to measure response were livability, body weight, egg production, eggshell quality, fertility, hatch and bone quality. Over the duration of the experiment, phytase-fed birds averaged 54.44% production per hen per day as compared to 51.06% for the control group. Mortality was about 11% for the phytase-fed birds as compared to 21% for the controls. Over the life of the flock, the hens fed the control diet produced 125 hatching eggs per hen housed while the phytase-fed birds was about 8%. Little difference in egg production was observed during the first 8 to 10 weeks of production. From 34 weeks of age, the phytase-fed birds began to exhibit greater egg production than the control group. By 45 weeks of age, the phytase-fed birds were laying about 6% more eggs than the control group. The weight of eggs produced by the phytase-fed birds and the control birds did not differ, averaging 25.7 oz/dozen for both groups. Based on eggshell weight and egg specific gravity, no differences in eggshell quantity or quality were evident between treatments. No differences in body weight between the two dietary treatments were observed until the hens were about 44 to 48 weeks of age. At this time, hens fed the control diet gained body weight at a more rapid rate than the phytase-fed hens. It would appear that phytase-fed birds were using energy for egg production rather than body weight gain.

Fertility and hatchability differed very little between the two treatments until the birds were about 44 weeks of age. After that, the phytase-fed birds maintained better fertility and hatch than the control-fed birds. Overall, there was an improvement of 1.2% in fertility and 2.4% in hatch with the phytase-fed hens. Average hatch of eggs from the control group was 82.76% as compared to 85.12% for the phytase-fed birds. Over the 35 weeks of this experiment, hens fed the control diet produced an average of 103 chicks per hen while the phytase-fed group produced an average of 113 chicks.

A critical measure of phosphorus adequacy of the feed is bone strength. Leg bones from phytase-fed hens showed slightly greater resistance to breaking under pressure than bones from the control group. Mineral content of the bones were also slightly greater for bones from the phytase-fed group.

A summary of the results of using phytase to provide a portion of the available phosphorus needed in broiler breeder diets is provided in the table. Over the duration of the trial, the phytase-fed birds

Continued on Page 3

Broiler Performance Data (Company)
Live Production Cost

	Average Co.	Top 25%	Top 5 Cos.
Feed cost/ton w/o color ($)	137.32	132.86	156.23
Feed cost/lb meat (¢)	14.20	15.28	14.23
Days to 4.6 lbs	43	51	38
Med. cost/ton (¢)	N/A	N/A	N/A
Chick cost/lb (¢)	2.66	3.44	4.54
Vac-Med cost/lb (¢)	0.40	0.39	0.54
WB & 1/2 parts condemn. cost/lb	0.82	0.24	0.57
% mortality	9.40	4.44	8.63
Sq. Ft. @ placement	1.00	1.05	0.88
Lbs./Sq. Ft.	8.51	6.51	6.53
Down time (days)	23	9	20

Data for week ending 6/09/01 N/A =Not Available

Broiler Whole Bird Condemnation (Region)

	SW	Mid-West	S. East	Mid-Atlantic	S. Central
% Septox	0.293	0.322	0.216	0.256	0.139
% Airsac	0.129	0.057	0.108	0.134	0.194
% I.P.	0.045	0.026	0.128	0.066	0.059
% Leukosis	0.003	0.003	0.007	0.030	0.002
% Bruise	0.006	0.004	0.010	0.007	0.010
% Other	0.020	0.005	0.014	0.013	0.013
% Total	0.497	0.417	0.484	0.505	0.417
% 1/2 parts condemnations	0.484	0.559	0.442	0.459	0.444

Data for week ending 6/9/01

exhibited improved egg production of about 8%, improved fertility of 1.2%, improved hatch of 2.4% and improved livability of 10%. A number of studies with poultry and with swine have demonstrated that the degradation of the phytate molecule by phytase releases nutrients other than phosphorus. In the design of this trial, release of these nutrients was not considered in formulation of the diets. Improved availabilities offer a possible explanation for the benefits associated with phytase use. The improvements attributed to use of phytase in this trial may be the result of release of energy, protein, amino acids, and/or minerals other than phosphorus. The data from this trial demonstrate that microbial phytase can be used in broiler breeder feeds to replace a portion of inorganic phosphorus.

Response	Control	Phytase
Mortality	21	11
Body Weight (lbs)	8.13	7.86
Egg Production (% hen/day)	51.06	54.44
Egg Weight (g)	61.19	61.24
Egg Shell Weight (g)	5.46	5.44
Egg Specific Gravity (g)	1.08	1.08
Fertility, %	94.84	96.05
Hatchability,%	82.76	85.12
Bone Breaking Strength, lbs	40.05	42.0
Bone Ash (5)	32.8	35.7

Broiler Whole Bird Condemnation (Company)

	Average Co.	Top 25%	Top 5 Co.'s
% Septox	0.242	0.243	N/A
% Airsac	0.131	0.069	N/A
% I.P.	0.073	0.048	N/A
% Leukosis	0.013	0.028	N/A
% Bruise	0.008	0.008	N/A
% Other	0.016	0.003	N/A
% Total	0.483	0.399	N/A
% 1/2 parts condemnations	0.499	0.384	N/A

Data for week ending 6/09/01 **N/A =Not Available**

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.

Male Management

Dr. Leonard Fussell, Veterinarian for Cobb-Vantress, Inc., discussed managing broiler breeder males at the Georgia Veterinary Medical Association annual meeting on June 10, 2001. His presentation focused on obtaining correct body weight in order to achieve optimum reproductive capacity and performance. He suggested growing males separately until they were at least six weeks of age. During this time, they should be on full feed, 18% protein with 1.0- 1.1% lysine, until they reach the four-week body weight. An overweight male can be just as detrimental to a breeding program as a lighter male, as these heavy males are prone to spinal abnormalities.

Dr. Fussell then discussed biosecurity and spiking males. An alternative to stud houses is to build a pen in one end of the hen house. This will reduce the risk of introducing pathogens into the hen house since these males are housed with the hens. A second newer technique in male management to optimize the use of males already present on the farm is called intra-spiking. In this system, males on the same farm are switched from one house to another. This results in increased sexual activity and fertility. There is no added biosecurity risk, cost, or mortality. This has been most beneficial if done prior to a decrease in fertility, usually around 40 weeks.

Sara Throne, DVM
Master of Avian Medicine Candidate

Challenges in Diagnosis of Infectious Laryngotracheitis Virus

At the recent Georgia Veterinary Medical Association annual meeting at Jekyll Island, Georgia, June 8-10, 2001, Dr. John Glisson and Dr. Maricarmen García presented new findings in the realm of Infectious Laryngotracheitis Virus (ILT) clinical presentation and diagnosis. Recent cases presented to The University of Georgia have resulted in new revelations in the nature and presentation of ILT.

Dr. Glisson presented the clinical picture of the cases. Several cases from Northeast Georgia have presented with upper respiratory disease, comprised of facial cellulitis, conjunctivitis, and tracheitis. The tracheitis was hallmarked with an extremely viscous mucous and reddened epithelium. Diagnostic tests performed included serology for IBV and NDV and histopathology. In two of the cases, intranuclear inclusions were found in the trachea and conjunctiva suspicious of ILT; however, the inclusions were infrequent and low in number.

Dr. García discussed the laboratory findings including virus isolation and PCR. Virus isolation attempts were successful on two cases. The virus was passed on CAM and chicken embryo liver cells. PCR analysis resulted in positives in cases that were negative by histopathology and virus isolation. It appears that the virus is similar to ILT vaccine viruses by PCR. These findings are very preliminary and work is continuing to determine their significance.

Karen Burns, DVM
Master of Avian Medicine Candidate

The Poultry Informed Professional Newsletter is published with support from Bayer Corporation

Water Quality inside the Poultry House

During the Deep South Poultry Conference in Tifton, GA on May 31 st , Dr. Casey W. Ritz, extension poultry scientist from The University of Georgia discussed some aspects related to the importance of providing good water quality in the poultry house. Water quality and water consumption variations are some of the most important aspects in a given flock. Water intake will vary greatly depending on air and water temperature. Consumption increases when the water temperature is less than the air temperature. Conversely, intake will decrease if the water temperature is higher than the air temperature. Some other factors that may influence water consumption are heat stress and age of birds. The following is a reference of the average daily water intake at different ages for broilers:

Age (weeks)	Gallons per day
1	250
2	475
3	825
4	1200
5	1600
6	1875
7	2000

Many factors can affect the quality of water. Microbial contamination is probably one of the most common. Total bacteria present in the water should not be above 100 cfu/ml. Variations in water pH may affect shell quality, induce equipment corrosion and have a detrimental effect in the effective administration of vaccines and medication. Nitrates and nitrates are compounds that are produced during the decomposition of organic matter and are typically a result of runoff from fertilizers and animal and human waster. Higher levels of nitrates (>25 mg/l) may affect embryo development and chick performance. Higher levels of nitrates may have diuretic/laxative effect. The water content of some other naturally occurring compounds such as Calcium, Chlorine, Copper, Iron, Lead, Magnesium, Sodium,, Sulfate, and Zinc are also important in terms of water flavor, odor, taste, and toxicity.

Maintaining clean and properly functioning watering equipment is essential to ensure a good water quality supply. Water samples should be taken on a regular basis in order to determine abnormal content or variation of the above mentioned compounds. Some techniques that may help to correct water quality problems include: 1) Routine flushing and disinfection of the system with compounds such as chlorine, citric acid, and vinegar; 2) Ion exchange treatment; 3) Reverse osmosis; 4) Ozonization; 5) Neutralization filters; and 6) UV disinfection.

Jamie Ruiz, DVM
Master of Avian Medicine Candidate

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 and Outlook" Reports

Broiler Eggs Set In 15 Selected States Up 1 Percent

According to the most recent National Agricultural (NASS) Reports commercial hatcheries in the 15-State weekly program set 185 million eggs in incubators during the week ending June 16, 2001. This was up 1 percent from the eggs set the corresponding week a year earlier. Average hatchability for chicks hatched during the week was 82 percent. Average hatchability is calculated by dividing chicks hatched during the week by eggs set three weeks earlier.

Broiler Chicks Placed Up 3 Percent

Broiler growers in the 15-State weekly program placed 153 million chicks for meat production during the week ending June 16, 2001. Placements were up 3 percent from the comparable week in 2000. Cumulative placements from December 31, 2000 through June 16, 2001 were 3.53 billion, down slightly from the same period a year earlier.

Four Additional States in Weekly Program

Beginning May 16, 2001 four additional States were added to the weekly program for broiler eggs set in incubators and broiler chicks placed for meat production. The four additional States are Kentucky, Louisiana, Missouri, and Oklahoma. Data collection and weekly estimates began with the week ending April 7, 2001.

Commercial hatcheries for the 19 States set a total of 206 million eggs in incubators during the week ending June 16, 2001. Broiler growers in the 19 States placed 171 million chicks for meat production during the week ending June 16, 2001.

May Egg Production Up 2 Percent

U.S. egg production totaled 7.23 billion during May 2001, up 2 percent from last year. Production included 6.11 billion table eggs and 1.13 billion hatching eggs, of which 1.06 billion were broiler-type and 70.0 million were egg-type. The total number of layers during May 2001 averaged 335 million, up 3 percent from the total average number of layers during May 2000. May egg production per 100 layers was 2,160 eggs, down 1 percent from 2,177 eggs in May 2000.

All layers in the U.S. on June 1, 2001, totaled 333 million, up 2 percent from a year ago. The 333 million layers consisted of 273 million layers producing table or commercial type eggs, 56.8 million layers producing broiler-type hatching eggs, and 2.95 million layers producing egg-type hatching eggs. Rate of lay per day on June 1, 2001, averaged 69.9 eggs per 100 layers, up slightly from the 69.7 eggs a year ago.

Laying flocks in the 30 major egg producing States produced 6.78 billion eggs during May 2001, up 2 percent from May 2000. The average number of layers during May, at 314 million, was up 3 percent from a year earlier.

Egg-Type Chicks Hatched Up 3 Percent

Egg-type chicks hatched during May totaled 42.6 million, up 3 percent from May 2000. Eggs in incubators totaled 37.7 million on June 1, 2001, up 14 percent from a year ago.

Domestic placements of egg-type pullet chicks for future hatchery supply flocks by leading breeders totaled 293,000 during May 2001, down 15 percent from May 2000.

Broiler Hatch Up Slightly

The May 2001 hatch of broiler-type chicks, at 776 million, was up slightly from May of the previous year. There were 644 million eggs in incubators on June 1, 2001, up 1 percent from a year earlier.

Leading breeders placed 7.12 million broiler-type pullet chicks for future domestic hatchery supply flocks during May 2001, down 4 percent from May 2000.

Turkey Eggs in Incubators on June 1 Up 2 Percent From Last Year

Turkey eggs in incubators on June 1, 2001, in the United States totaled 33.8 million, up 2 percent from June 1 a year ago. Eggs in incubators were up 3 percent from the May 1 total of 32.7 million. Regional changes from the previous year were: East North Central, up 6 percent; West North Central, up 8 percent; North and South Atlantic, up 2 percent; South Central, down 5 percent; and West, down 15 percent.

Poults Placed During May Up 4 Percent From Last Year

The 26.8 million poults placed during May 2001 in the United States were up 4 percent from the number placed during the same month a year ago. Placements were up 4 percent from the April 2001 total of 25.9 million. Regional changes from the previous year were: East North Central, up 12 percent; West North Central, up 15 percent; North and South Atlantic, up 1 percent; South Central, down 10 percent; and West, down 14 percent.

Poultry Production To Rise Moderately

According to the the latest Economic Research Service (ERS) Reports, poultry output in 2002 is expected to rise about 3 percent, compared with a less than 1-percent increase expected this year. As improving net returns to broiler processors will likely encourage a 3-percent boost in broiler production next year. Wholesale whole broiler prices will likely register a modest increase into the low-60-cents-per-pound in 2002, compared with high-50-cents this year. With continued low feed costs, net returns should improve. A key factor in higher broiler prices is the continuing strong export market. Broiler exports have been boosted by strong sales in Eastern Europe and China. Turkey production is expected to increase about 2 percent in 2002, compared with a 4-percent rise this year. Turkey prices are expected to average about the same in 2002 as this year, around 68 cents per pound.

First Quarter Broiler Production Falls, Exports Rise

Domestic broiler meat production in first-quarter 2001 was reported at 7.507 billion pounds, down 1.3 percent from first-quarter 2000. The lower production was chiefly the result of a reduction in the numbers of birds slaughtered as average weights were about the same as in the previous year. Production in second-quarter 2001 is expected to be 7.8 billion pounds, marginally higher than the same period in 2000. Very little or no growth is expected in the size of the broiler laying flock due to the static prices of the key breast meat market. Broiler meat production in 2001 is now expected to total 30.6 billion pounds, up less than 1 percent from 2000. In 2002, production is expected to total 31.5 billion pounds, up about 3 percent from 2001' s expected output.

Broiler exports posted strong gains in the first quarter of 2001. Strong demand from most major markets pulled total exports to 1.530 billion pounds, 12 percent higher than in the first quarter of 2000. Most of the growth has come from higher shipments to Asia and Eastern European markets. First-quarter 2001 exports to Hong Kong totaled 369 million pounds, up 12 percent from a year earlier. Shipments have also risen strongly to Korea, up 30 percent to 52 million pounds. The Eastern European markets have had a variety of changes. Broiler products being exported to the Baltic nations primarily for transshipment to Russia are sharply lower. However, direct exports to Russia have risen by 75 percent to 491 million pounds and exports to such countries as Poland, the Ukraine, and Georgia are dramatically higher. Export growth in the remainder of 2001 is not expected to be as high as that of the first quarter, but it is expected to remain considerably stronger than the previous year. Exports for 2001 are expected to reach 5.9 billion pounds, up slightly over 375 million pounds and a 7-percent increase from 2000.

Although conditions in the export market can alter rapidly, the continued growth in broiler shipments to a wide number of countries during 2000 and through the first quarter of 2001 provides a basis for expectations of continuing growth in 2002. In 2002, broiler exports are expected to be about 6.2 billion pounds, up nearly 5 percent from the projected exports for 2001. The changes in production and exports will result in a domestic per capita consumption of 76.5 pounds in 2002 on a retail weight basis. This is about 1 pound higher than in 2001 and only slightly lower than in 2000 and 1999.

The lower domestic broiler production and strong export market in the first quarter of 2001 is slowly placing upward pressure on some broiler part prices. The strength of exports to Eastern European and the Hong Kong/China markets has had the most impact on the prices for leg quarters and wings. During the first quarter of 2001, exports of leg quarters to Eastern European markets totaled over 295 million pounds, an increase of over 100 percent from first-quarter 2000. Wing exports so far in 2001 to the Hong Kong/China market have totaled 70 million pounds, up 76 percent from the same period in 2000.

During the first 3 months of 2001, leg quarter prices averaged 21 cents a pound in the Northeast, up 12 percent from first-quarter 2000. Leg quarter prices have strengthened even further since then with the April price up 4.5 cents over the March average of 22.5 cents. There has been an even stronger increase in wing prices. First-quarter wing prices in the Northeast averaged 96 cents, up over 30 cents (49 percent) from the same period in 2000. Wing prices have also been boosted by greater usage in the domestic fast food market. Since boneless skinless breast meat is almost solely sold domestically, its prices have not benefited from the rising export market. Prices in the Northeast averaged $1.32 a pound in first-quarter 2001, which is down 2 percent from the previous year. However, this is a 9-percent increase from fourth-quarter 2000. With almost no growth expected in domestic broiler production in 2001, strong export demand, and a decline in beef production, broiler part prices are expected to continue to gain strength through most of 2001. The only major downward pressure would come from lower demand due to a weakening of the domestic economy.

Meetings, Seminars and Conventions

2001 July

July 14-18: ***AVMA-AAAP Meeting,*** Boston, MA. Hotel Reservations: Internet (online reservations) www.avma.org Registration for meeting: AVMA, 1931 North Meacham Rd., Suite 100, Schaumburg, IL 60173-4360. Fax: 312-705-2561.

July 17-18: ***Hatchery-Breeder Clinic,*** Sheraton Atlanta Hotel,Atlanta. Details from U.S. Poultry & Egg Association, 1530 Cooledge Road, Tucker, GA 30084-7303; Phone: 770-493-9401; Fax: 770-493-9257; E-mail: seminar@poultryegg.org

July 20-21: ***Alabama Poultry & Egg Association Annual Meeting and Convention,*** Sandestin Beach Hilton, Destin, Fla. Details from AP&EA, P.O. Box 240, Montgomery, AL 36101; Phone: 334-265-2732; Fax: 334-265-0008.

2001 August

Aug. 24: ***- International Course on Poultry Husbandry.*** Contact: IPC Livestock Barneveld College, P.O. box 64, 3770 AB Barneveld, The -+Netherlands. Phone: +31 342 414881; Fax: +31 342 492813; E-mail: io@ipcdier.hacom.nl

2001 September

Sept. 1-4: ***6th European Symposium on Poultry Welfare,*** Zollikofen, Switzerland. Contact: Alois Mettler, WPSA Symposium 2001, Burgerweg 24, CH-3052 Zollikofen, Switzerland. Fax: +41 31 911 64 60.

Sept. 4: ***Northern Ireland Poultry Industry Conference,*** Loughry College, Cookstown, Co. Tyrone, N. Ireland. Contact: Basil Bayne, Greenmount College, 22 Greenmount Road, Antrium BT41 4PU, Ireland. Phone: +44 (0) 28 9442 6786; Fax: +44 (0) 1849 426606; E-mail: Basil.bayne@dani.gov.uk

Sept. 4-7: ***3rd Ukraian Poultry Conference,*** Crimea, Ukraine. Organised by Poultry Institute of the Ukrainian Academy of Agrarian Sciences and the Ukrainian Branch WPSA. Contact: Dr. Taghirov Makhsud, Organising Committee Secretary, Poultry Research Institute,Birky, Zmiiv District, Kharkiv Region 63421, Ukraine. Phone: +380 (0) 5747 78005, 78006, 34439; Fax: +380 (0) 5747 39458; E-mail: poultry@zmiev.kharkov.com

Sept. 11-13: ***The Poultry Federation (Arkansas, Missouri, Oklahoma) Nutrition Conference,*** Clarion Inn, Fayetteville,Ark. Details from Judy Kimbrell, The Poultry Federation, P.O. Box 1446, Little Rock, AR 72203; Phone: 501-375-8131; Fax: 501-375-5519

Sept. 9-12: ***IX European Symposium on the Quality of Eggs and Egg Products & XV European Symposium on the Quality of Poultry Meat,*** Contact: Dr. S. Yalcin, Secretary of WPSA Turkish Branch, Ege University, Faculty of Agriculture, Dept. of Animal Science, 35100 Izmir-Turkey. Phone +90 232 388 4000/1449 (ext.); Fax: +90 232 388 1864. E-mail: yalcin@ziraat.ege.edu.tr

Sept. 12-14: ***2nd Poultry Genetics Symposium,*** Organised by the Institute for Small Animals Research, Godollo, Hungary and WPSA Working Group 3 'Breeding and Genetics'. Contact: Dr. Hidas Andras. Institute for Small Animals Research. H-2100 Godollo, Isaszegi ut, (P.O. Box 147). Phone: +36 28 420 387; Fax: +36 28 430 184; Email: hidas@katki.hu

Sept. 17-18: ***Incubation and Fertility Research Group,*** (WPSA Working Group 6 (Reproduction). St. Edmund's Hall, University of Oxford, UK. Contact: Dr. Charles Deeming, Hatchery Consulting & Research, 17 Rowland Close Wallingford, Oxfordshire, OX10 8LA, UK. Phone/Fax: +44 (0) 1491 835542 or http://193.61.15.84/ifrg/ifrg.htm (with online form.

Sept. 19-20: ***Poultry Production and Health Seminar,*** Marriott Downtown Hotel, Memphis, Tenn. Details from U.S. Poultry & Egg Association, 1530 Cooledge Road,Tucker, GA 30084-7303; Phone: 770-493-9401; Fax: 770-493-9257; E-mail: seminar@poultryegg.org

Sept. 17-21: ***World Veterinary Poultry Association XII International Congress,*** Current developments and prospects for poultry disease prevention and control, Cairo, Egypt. contact: Cairo International Conference Centre, Prof. Dr. A.A. Sami Ahmed, President, Organising Committee, PO Box 2399, Cairo,Egypt. Phone: +202 2442587; Fax: +202 2474955; E-mail: mipco@thewayout.net

Sept. 25-26: ***Georgia Poultry Conference,*** the Classic Center, Athens, GA. Contact: Georgia Poultry Federation, P.O. Box 763, Gainesville, GA 30503. Phone: 770-532-0473; or Extension Poultry Science, University of Georgia, Athens, GA 30602. Phone: 770-542-1325.

Sept. 30-Oct. 4: ***13th European Symposium on Poultry Nutrition,*** Floreal Club, Koning Albertlaan 59, 8370 Blankenberge, Belgium. contact: Semico-Seminar and Congress Organisation Office, Korte Meer, 16.

2001 October

Oct. 2-3: ***Alabama Broiler Industry Seminar,*** Auburn University Hotel and Dixon Conference Center, Auburn, AL Details from AP&EA, P.O. Box 240, Montgomery, AL 36101; Phone: 334-265-2732; Fax: 334-265-0008.

Oct. 3-5: ***Poultry Service Industry Workshop (PSIW),*** Annual Workshop, The Banff Centre, Banff, Alberta, Canada. Details from Sandy Clarke, PSIW, #905 O.S. Longman Building, 6909 - 116 Street, Edmonton, Alberta, Canada, TGH-4P2; Phone: 780-422-0508; Fax: 780-427-1439. E-mail: sandra.clarke@gov.ab.ca

Oct. 4-7: ***Fieravioca, 40th International Poultry Show,*** Forli, Italy. Contact: Phone: +39 0543 793511; Fax: +39 0543 724488; E-mail: info@fieravicola.com; Internet: www.fieravicola.com

Oct. 9-12: ***XVII Latin American Poultry Congress,*** Guatemala City, Guatemala. Contact: Anavi, Avenida De La Reforma 8-60, Zona 9, Edificio Galerias Reforma, Torre II, 9° Nivel, Oficina 904, Guatemala City, Guatemala. Phone: (502) 331 1381; Fax: (502) 339 2338; Email: latino@terra.com.gt; Internet: www.XVIII-latinoavicola.org.gt

Oct. 12-13: ***Poultry Protein & Fat Seminar,*** Radisson Hotel, Memphis, Tenn. Contact: U.S. Poultry & Egg Association, 1530 Cooledge Road, Tucker, GA 30084-7303. Phone: 770-493-9401.

Oct. 17-19: ***National Meeting on Poultry Health and Processing,*** Clarion Resort Fontainebleau, Ocean City, Maryland. Contact: Karen Adams at adams@dpichicken.com or Fax: 302-856-1845.

Meetings, Seminars and Conventions

2001 November

Nov. 1-3: ***Effective Broiler Breeder Management,*** Holiday Inn, Utrecht, Netherlands: contact: Elaine Robson, Positive Action Conferences.
Phone: +44(0)1377 256316;
Fax: +44(0)1377 254663
E-mail: conf@positiveaction.co.uk
Nov. 5: ***Salmonella 2001 Conference***, Holiday Inn, Utrecht, Netherlands. Contact: Elaine Robson,Positive Action Conferences.
Phone: +44(0)1377 245663;
Fax: +44(0)1377 254663;
Email: conf@positiveaction,co.uk
Nov. 6-9: ***VIV Europe,*** 2001, Royal Dutch Jaarbeurs Exhibition Center, Utrecht. contact: RoyalDutch Jaarbeurs, P.O. box 8500, NL 3503 RM, Utrecht, The Netherlands,
Phone: + 31 (0) 30 295 5662;
Fax: + 31 (0) 30 295 57 09.

2002 January

Jan. 14-15: ***International Poultry Scientific Forum,*** Georgia World Congress Centre, Atlanta, Georgia, USA. Contact: Yvonne Vizzier Thaxton, Executive Secretary, SPSS, Mississippi State University, Dept. of Poultry Science, Box 9665, Mississippi State, MS 39762.
E-mail: spss@technologist.com
Jan. 16-18: ***International Poultry Exposition Atlanta 2002,*** Georgia World Congress Centre, Atlanta, Georgia, USA. Contact: US Poultry & Egg Association, 1530 Cooledge Road, Tucker, Georgia 30084-7804, USA. Phone: +1 770-493-9401; Fax: +1 770-493-9257;
E-mail: expogeneralinfo@poultryegg.org;
Internet: www.poultryegg.org

2002 March

March 21-23: ***VIV Canada 2002,*** Toronto, Canada. Contact: Royal Dutch Jaarbeurs, PO Box 8500, 3503 RM Utrecht, the Netherlands. Phone: +31 30 295 56 62; Fax: +31 295 57 09.
E-mail: canada@jaarbeursutrecht.nl.
Canadian Swine Exporters Association, PO Box 150, Hickson,Ontario, NoJ iLo, Canada. Phone: +1 519 462 2929; Fax: +1 519 462 2417.
E-mail: csea@execulink.com

2002 April

April 24-26: ***VIV China 2002,*** China International Exhibition Centre, Beijing, P.R. China. Contact: Royal Dutch Jaarbeurs, P.O. Box 8500, 3503 RM Utrecht, the Netherlands. Phone: +31 30 295 5662; Fax: +31 30 295 5709;
E-mail: viv.china@jaarbeursutrecht.nl

2002 May

May 27-31: ***X International Seminar in Avian Pathology and Poultry Production (In Spanish),*** Georgia, USA. Contact: Dr. Pedro Villegas, Department of Avian Medicine, The University of Georgia, Athens, GA 30602-4875, USA. Fax: +1-706-542-5630;
E-mail: sem2002@arches.uga.edu

2002 August

Aug 19-23: ***The 7th World Congress of Genetics Applied to Livestock Production,*** Le Corum Conference Centre of Montpellier, France: Contact: http://wcgalp.toulouse.inra.fr

2002 September

Sept. 6-10: ***11th European Poultry Conference,*** Bremen, Germany. Contact: 11th European Poultry Conference, 2002, Congress Partner, Birkenstr 17, D-28195 Bremen, Germany.
Phone: +49 421 303130; Fax: +49 421 303133;
E-mail: Bremen@cpb.de

2002 October

Oct. 6-10: ***7th WPSA Asian Pacific Federation Conference,*** Conrad Jupiter's Hotel, Gold coast, Queensland, Australia. In conjunction with 12th Australian Poultry & Feed Convention. Hotel Conrad, Jupiters Casino, Gold Coast, Queensland, Australia. Contact: APFC 2002 Conference Managers, GPO Box 128, Sydney, NSW 2001, Australia. Phone: +61 2 9262 2277; Fax: +61 2 9262 3135; E-mail: apfc2002@tourhosts.com.au; Internet: http://www/tourhosts.com.au/apfc2002
Oct. 6-11: ***3rd International Workshop on the Molecular Pathogenesis of Marek's Disease and the Avian Immunology Research Group Meeting,*** Dead Sea, Israel. Contact: MAREKS-AIRG at Target Tours, P.O. Box 29041, Tel Aviv 61290, Israel. Phone: +972 3 5175150;
Fax: +972 3 5175155;
E-mail: mareks-airg@targetconf.com
Oct. 17-19: ***National Meeting on Poultry Health & Processing,*** Sheraton Fountainbleau Hotel, Ocean City, Maryland, USA. Contact: Sharon Webb, Delmarva Poultry Industry, Inc., RD 6, Box 47, Georgetown, DE 19947-9575, USA. Fax: +1 302-856-1845

2003 July

July 19-23: ***XIII Congress of the World Veterinary Poultry Association,*** Denver, CO, USA. Contact: Details are not currently available but will eventually be posted on the web site of the American Association of Avian Pathologists.