



The Poultry Informed Professional

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Phone (706) 542-5645 Fax (706) 542-5630
 e-mail: sclanton@arches.uga.edu

POTENTIAL OPPORTUNITIES WITH A SAND-BASED LITTER

S. F. Bilgili, J. B. Hess, M. K. Eckman, and J. P. Blake
 Department of Poultry Science
 Auburn University
 Auburn, AL 36849-5416
 and Bill Peterson
 Live Production Manager
 Ingram Farms, Inc.
 Cullman, AL 35056

In most integrated poultry operations, the logistical, operational and economical constraints necessitate the concentration of live broiler production farms within close proximity of the centralized hatchery, feed mill, and processing facilities. This efficiency driven structure often results in geographically dense poultry production regions with excessive demand on critical management inputs (labor, utilities, and bedding materials), as well as outputs (farm mortalities and manure).

Commercially, virtually all broiler chickens in the United States are raised on the floor using some type of a bedding material (litter) to segregate and insulate birds from the ground or flooring, and to absorb excess moisture from the droppings and the drinkers. The nature, quantity, and quality of the bedding material used varies greatly from region to region, based primarily on local availability and cost of agricultural by-products.

Pine shavings and sawdust are currently the most predominant and preferred

Broiler Performance Data (Region) Live Production Cost					
	SW	Midwest	Southeast	Mid-Atlantic	S-Central
Feed cost/ton w/o color (\$)	129.79	120.56	134.88	135.04	134.86
Feed cost/lb meat (¢)	12.17	11.63	12.59	13.20	12.61
Days to 4.6 lbs	45	44	43	44	44
Med. cost/ton (¢)	N/A	N/A	N/A	N/A	N/A
Chick cost/lb (¢)	4.07	4.01	4.07	3.66	4.03
Vac-Med cost/lb (¢)	0.06	0.01	0.13	0.04	0.08
WB & 1/2 parts condemn. cost/lb	0.29	0.25	0.22	0.27	0.23
% mortality	5.58	4.44	3.81	5.30	4.81
Sq. Ft. @ placement	0.76	0.75	0.78	0.76	0.80
Lbs./Sq. Ft.	6.38	6.92	6.62	7.35	6.67
Down time (days)	16	14	18	16	15

Data for week ending 4/14/01 N/A = Not Available

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bedding materials for broiler production in the US. At times, a number of other materials are substituted regionally in place of pine products, including hardwood shavings (Carter et al., 1979), peanut hulls (Lien et al., 1998), bark (Dang et al., 1978), rice hulls (Veltmann et al., 1984), kenaf core (Malone et al., 1990), and straw (Hermes, 1996). Periodically, the by-products of other industries have received interest as bedding materials, primarily driven by local recycling efforts and entrepreneurship. Products such as recycled or shredded paper (Blake and McDaniel, 1998; Lien et al., 1992; Malone and Chaloupka, 1983), ground drywall waste (Reed and Mitchell, 1997) and particle-board residue (Hester et al., 1997) have been field tested successfully (Hess et al, 2000).

Basically, two broad factors triggered our interest in sand as a bedding material for broilers: 1) the lack of availability and/or high cost of wood-based products, primarily due to competition from alternative value-added uses, and 2) increasing restrictions on land application or disposal of used litter arising from emerging environmental issues and regulatory oversight.

Growing chickens on sand is not a new or novel concept. Sand has been used as a bedding material for poultry in early days of the broiler industry in the US, and is currently being used in many countries around the world with limited forestry resources. Sand has also been used successfully by the dairy industry as a non-carbon based bedding material. Research conducted at the Department of Poultry Science at Auburn University for the past four years has examined the feasibility of using sand as a bedding material for broilers. The project has been carried out in two phases. The first phase involved comparison of sand with pine shavings in controlled replicated pen studies. In the second phase, sand is evaluated as a bedding material under commercial conditions.

Floor-pen research on sand as a bedding source for broilers

Floor-pen studies were conducted successively over a two-year period, in which sand (washed, mortar or building grade sand) was compared with pine shavings in terms of live production and processing performance, health, and in-house environmental factors (Alley et al., 1998; Bilgili et al., 1999a, b). Live performance (growth rate, feed conversion, and livability) of broilers grown on sand was comparable to those reared on pine shavings over a two-year period. Similar results were obtained for the processing parameters (carcass and deboning yields, and grade). Foot pad quality of birds raised on sand was consistently better than those raised on pine shavings. Litter moisture, temperature, and ammonia production measurements did not show significant differences between the two litter types. However, bacteria levels (coliforms and aerobic plate counts) were significantly reduced on sand litter.

Commercial application of sand as a bedding source for broilers

Currently, there are six commercial broiler houses (40 x 400 ft) bedded with sand in Alabama, with anywhere from 2 to 16 grow-outs completed. In addition, plans are underway to include seven more houses by this fall to broaden the geographical and company-wide participation in this study. With few exceptions, most of the houses are bedded

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

	Average Co.	Top 25%	Top 5 Cos.
Feed cost/ton w/o color (\$)	132.94	128.79	N/A
Feed cost/lb meat (¢)	12.52	11.84	N/A
Days to 4.6 lbs	44	44	N/A
Med. cost/ton (¢)	N/A	N/A	N/A
Chick cost/lb (¢)	4.06	3.81	N/A
Vac-Med cost/lb (¢)	0.08	0.05	N/A
WB & 1/2 parts condemn. cost/lb	0.27	0.16	N/A
% mortality	4.72	3.18	N/A
Sq. Ft. @ placement	0.76	0.76	N/A
Lbs./Sq. Ft.	6.83	6.47	N/A
Down time (days)	16	16	N/A

Data for week ending 4/14/01

N/A =Not Available

Broiler Whole Bird Condemnation (Region)

	SW	Mid-West	S. East	Mid-Atlantic	S. Central
% Septox	0.391	0.404	0.151	0.364	0.250
% Airsac	0.181	0.080	0.230	0.209	0.129
% I.P.	0.057	0.029	0.074	0.103	0.148
% Leukosis	0.004	0.004	0.002	0.030	0.008
% Bruise	0.008	0.006	0.014	0.011	0.012
% Other	0.032	0.007	0.018	0.012	0.013
% Total	0.673	0.530	0.489	0.730	0.561
% 1/2 parts condemnations	0.558	0.541	0.422	0.390	0.401

Data for week ending 4/14/01

with washed mortar sand at a depth of 4 inches (about 300 tons per house). Field experience with sand as litter over the last two years has given us a unique perspective. Following are a list of our critical observations: 1. Once the sand is placed, ample time and ventilation is necessary to assure dryness. This is very critical prior to initiation of brooding, as sand usually carries excessive moisture from outside storage at commercial sources. 2. Bird activity in the house quickly levels and packs the sand during the first grow-out. It may be necessary to inform and educate the catching crews, especially the hoist driver, to anticipate the fluffiness and shifting characteristic of sand during maneuvering in the house, as compared to wood shavings.

3. We have had problems with cup drinkers, as sand accumulation eventually caused water leaks and wet litter in the house. However, it was much easier to dry sand in the house after a major water leak.

4. Brooding can be a problem, especially if pancake brooders are not available. We have had complaints about cold bedding, excessive gas use to keep the house warm and high early chick mortality due to sand consumption. However, in all of these cases, other management factors (wet sand, inadequate pre-warming, starve-outs etc.) were involved.

5. In general, we have seen 2°F temperature differential with sand, warmer in winter and cooler in summer, as compared to pine shavings litter. This is an interesting observation and may actually be beneficial in reducing heat stress mortality.

6. In terms of weight gain, livability, and whole bird condemnations in the plant, birds reared on sand have performed equal to or better than sister flocks reared at the same farm on pine shavings. This is remarkable considering the fact that caked litter is removed and fresh litter is added between the successive grow-outs in pine shavings houses. Usually, very little caked sand is removed and no top dressing is employed with sand litter houses.

7. Compared to pine shavings, there is visually very low incidence and activity of darkling beetles in sand litter. This, of course, may eliminate the need and expense of chemical control measures in the long term.

8. House ammonia has not been a major problem, even after 15 successive flocks on sand. In this particular farm, where sand was used for 26 months, we only detected 60 ppm ammonia in the sand house, as compared to 20-30 ppm on houses bedded with pine shavings after one flock.

9. After two years of use, the height of the litter in the broiler house has increased about 2 inches. This necessitated the removal of some litter, mostly light organic material. Since sand is heavier, it continuously sifts the lighter, dried-organic material to the surface. New technologies may be available soon to specifically separate this material from the sand in the house.

10. Feathering initially appears rough on birds, possibly due to increased “dust bathing” behavior in the house. This does not affect the carcass quality in the plant. As a matter of fact, because of lower bacterial viability in the bedding environment, whole-bird condemnations has been lower as compared to pine shavings houses. Certainly the most important characteristic of sand bedding is its durability or long use-life. We now anticipate that with periodic cleaning (screening, heat sterilization, and even washing) sand may be used for up to 5 years in broiler houses. This is a tremendous economic advantage for the producer compared to pine shavings litter. Depending on the cost of alternative bedding materials available, pay-back on the initial cost may be as early as 1.5 years. Research is currently underway to explore new markets for used sand after clean-out. Increased use of sand commercially should reduce the yearly litter disposal, alleviating environmental concerns while providing novel and lucrative markets for the producers. It is our hope that used sand will actually create a demand for specific uses (i.e., turf grass, athletic fields, golf courses) such that its replacement at the farm level may even be subsidized.

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Broiler Whole Bird Condemnation (Company)

	Average Co.	Top 25%	Top 5 Co.'s
% Septox	0.302	0.215	N/A
% Airsac	0.172	0.125	N/A
% I.P.	0.092	0.077	N/A
% Leukosis	0.015	0.006	N/A
% Bruise	0.011	0.016	N/A
% Other	0.018	0.006	N/A
% Total	0.611	0.445	N/A
% 1/2 parts condemnations	0.506	0.261	N/A

Data for week ending 4/14/01 N/A =Not Available



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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 and Outlook" Reports

from last year. Production included 6.22 billion table eggs and 1.11 billion hatching eggs, of which 1.05 billion were broiler-type and 67.0 million were egg-type. The total number of layers during March 2001 averaged 337 million, up 2 percent from the total average number of layers during March 2000. March egg production per 100 layers was 2,178 eggs, down slightly from 2,186 eggs in March 2000.

All layers in the U.S. on April 1, 2001, totaled 337 million, up 2 percent from a year ago. The 337 million layers consisted of 278 million layers producing table or commercial type eggs, 56.4 million layers producing broiler-type hatching eggs, and 2.80 million layers producing egg-type hatching eggs. Rate of lay per day on April 1, 2001, averaged 70.9 eggs per 100 layers, down slightly from the 71.2 eggs a year ago.

Laying flocks in the 30 major egg producing States produced 6.87 billion eggs during March 2001, up 1 percent from March 2000. The average number of layers during March, at 315 million, was up 2 percent from a year earlier.

Egg-Type Chicks Hatched Up 3 Percent

Egg-type chicks hatched during March totaled 40 million, up 3 percent from March 2000. Eggs in incubators totaled 36.0 million on April 1, 2001, up 9 percent from a year ago.

Domestic placements of egg-type pullet chicks for future hatchery supply flocks by leading breeders totaled 372,000 during March 2001, up 30 percent from March 2000.

Broiler Hatch Up 1 Percent

The March 2001 hatch of broiler-type chicks, at 763 million, was up 1 percent from March of the previous year. There were 627 million eggs in incubators on April 1, 2001, down 1 percent from 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.

Leading breeders placed 6.75 million broiler-type pullet chicks for future domestic hatchery supply flocks during March 2001, down 8 percent from March 2000.

Turkey Eggs in Incubators on April 1 Down Slightly From Last Year

Turkey eggs in incubators on April 1, 2001, in the United States totaled 32.6 million, down slightly from April 1 a year ago. Eggs in incubators were up 3 percent from the March 1 total of 31.7 million. Regional changes from the previous year were: East North Central, up 3 percent; West North Central, up 12 percent; North and South Atlantic, down 4 percent; South Central, down 18 percent; and West, down 11 percent.

Poults Placed During March Up 1 Percent From Last Year

The 25.9 million poults placed during March 2001 in the United States were up 1 percent from the number placed during the same month a year ago. Placements were up 10 percent from the February 2001 total of 23.7 million. Regional changes from the previous year were: East North Central, up 3 percent; West North Central, up 3 percent; North and South Atlantic, unchanged; South Central, down 13 percent; and West, up 6 percent.

Broiler Eggs Set In 15 Selected States Down 2 Percent

According to the most recent National Agricultural Statistics Service (NASS) reports, commercial hatcheries in the 15-State weekly program set 183 million eggs in incubators during the week ending April 21, 2001. This was down 2 percent from the eggs set the corresponding week a year earlier.

Broiler Chicks Placed Down 1 Percent

Broiler growers in the 15-State weekly program placed 147 million chicks for meat production during the week ending April 21, 2001. Placements were down 1 percent from the comparable week in 2000. Cumulative placements from December 31, 2000 through April 21, 2001 were 2.33 billion, down slightly from the same period a year earlier.

March Egg Production Up 1 Percent

U.S. egg production totaled 7.33 billion during March 2001, up 1 percent from March 2000. The average number of layers during March 2001 averaged 337 million, up 2 percent from the total average number of layers during March 2000. March egg production per 100 layers was 2,178 eggs, down slightly from 2,186 eggs in March 2000.

First Quarter Broiler Production Falls, First Time Since 1982, Exports Strong

According to the most recent Economic Research Service (ERS) reports, based on monthly and weekly estimates, first-quarter 2001 broiler production is estimated at 7.55 billion pounds, down about 1 percent from first-quarter 2000. This is the first time that there has been a year-over-year quarterly decline in broiler production since 1982. Production in second-quarter 2001 is projected to be only slightly higher than a year earlier. Weekly estimates of eggs set and chicks placed through the middle of April show little or no growth compared with the same period a year earlier.

Although domestic broiler production likely declined in the first quarter, broiler exports have continued to show strong gains. During January and February 2001, broiler exports totaled 1.076 billion pounds, up 11 percent from the previous year. The majority of the growth has come from larger shipments to Asian and Russian markets. Exports to Hong Kong in the first two months of 2001 totaled 235 million pounds, up 15 percent from a year earlier and shipments to Korea were up 39 percent. The Eastern European markets have been marked by a number of changes. Fewer broiler products are now moving through the Baltic nations, as shipments to those nations fell by 89 percent. However, this decline has been made up by greater exports to Poland, Ukraine, Georgia, and Russia. Mexico also continues to be a growing market for U.S. broiler products. After increasing by 21 percent in 2000, shipments to Mexico have expanded 12 percent in the first two months of 2001.

With production slowing and exports strong, there has been some upward pressure on prices. Most of the increase has been in prices for leg quarters and wings. Over the last 6-8 weeks, leg quarter prices in the Northeast region have risen by 5-7 cents a pound, and wing prices have remained strong, averaging between 95 to 99 cents a pound in March and slightly higher in the first half of April. Prices for boneless skinless breast meat have not yet benefited from the slowdown in production. After averaging \$1.37 a pound in February, prices in the Northeast region have remained between \$1.31 and \$1.38 a pound during March and the first half of April.

Turkey Exports Move Higher

Over the first two months of 2001, turkey exports have totaled 79 million pounds, 26 percent higher than the same period in 2000. Mexico continues to be by far the largest market, but the increase in shipments so far in 2001 has been concentrated in larger exports to Poland, Russia, and Korea.

Shipments to Russia are more than triple those of the same period in 2000 and exports to Poland are up almost 900 percent. While this is definitely a boost to domestic turkey producers, Russia and Poland have been rather erratic markets in the past, very strong at times and then falling to almost nothing. Exports to Poland and Russia are expected to remain strong until the FMD problem in the EU is controlled. Exports of turkey products to Korea strengthened during the second half of 2000 and have continued to be strong in the first two months of 2001, up about 150 percent from the same period in 2000.

**Georgia Veterinary Medical Association
Poultry Program
June 8-9, 2001
Jekyll Island, Georgia**

**The GVMA Program is Featured on the Next Page
*Be sure to make your room reservations early.***

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Jekyll Island Club(800) 535-9547
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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.

GVMA 2001 Poultry Program

Friday, June 8

Moderator - Dr. John Glisson

9:00 - 9:45	MG Epidemiology in North Carolina	Dr. Algis Martinez <i>(North Carolina State University)</i>
9:45 - 10:15	Current Research on Infectious Laryngotracheitis	Dr. Maricarmen Garcia <i>(University of Georgia)</i>
10:15 - 10:45	Break	
10:45 - 11:45	Advances in Transgenic Research in Chickens	Dr. Mike McDonell <i>(AviGenics, Inc.)</i>
11:45 - 12:15	Review of Respiratory Disease for 2000-2001	Dr. Louise Dufour-Zavala <i>(Georgia Poultry Laboratories)</i>

Saturday, June 9

Moderator - Dr. Stan Kleven

8:30 - 9:30	Clinical Presentation of Exotic Diseases Velogenic Newcastle Disease	Dr. Bill Hewat <i>(Tyson Foods, Inc.)</i>
	Avian Pneumovirus	Dr. Dave Halvorson <i>(University of Minnesota)</i>
9:30 - 10:00	Antibiotic Resistance Issues	Dr. Chuck Hofacre <i>(University of Georgia)</i>
10:00 - 10:30	Break	
10:30 - 11:15	Management of Broiler Breeder Males	Dr. Leonard Fussell <i>(Cobb Vantress, Inc.)</i>
11:15 - 12:15	Inactivated Autogenous IBDV Vaccines	Dr. John Donahoe <i>(Lohmann Animal Health)</i> Dr. John Smith <i>(Fieldale Farms, Inc.)</i> Dr. Marshall Putnam <i>(Wayne Poultry)</i>

Meetings, Seminars and Conventions

2001 May

May 19: *GPF Night of Knights*, Cobb Galleria, Atlanta, GA Contact: Georgia Poultry Federation, P.O. Box 763, Gainesville, GA 30503. Phone 770-532-0473.

2001 June

June 1-3: *AP&EA Conv.*, Birmingham-Jefferson Convention Complex, Birmingham, AL. Contact: Alabama Poultry & Egg Association, P.O. Box 240, Montgomery, AL 36101. Phone: 334-265-2732.

June 7-10: *Georgia Veterinary Medical Association Annual Meeting*, Jekyll Island, GA. Contact: GVMA, 3050 Holcomb Bridge Rd., Norcross, GA 30071-1362. Phone: 770-416-1633; Fax: 770-416-9095.

June 8-9: *APF Poultry Festival*, Arlington Hotel, Hot Springs, Ark. Contact: Judy Kimbrell, Poultry Federation, P.O. Box 1446, Little Rock, Ark. 72203. Phone: 501-375-8131.

June 27-29: *73rd Annual Conference on Avian Diseases*, Theme of meeting, "The Future of the Poultry Industry." Hosted by: The University of Maryland. Website: www.vetmed.umd.edu

June 29-30: *Alabama Veterinary Medical Association Meeting*, Marriott Grand Hotel, Point Clear, Alabama. Contact: Joel L. Cline, DVM., J.B. Taylor Diagnostic Lab., 495 Alabama 203, Elba, AL 36323. Phone: 334-897-6340

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.

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@ipcudier.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. 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. 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. 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. 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, 9º 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. 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.

2001 November

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. 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, USA. Fax: +1 770-493-9257.

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 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: sem202@arches.uga.com