BACTERIAL DISEASES

AIRES, D.S., PARENTE, C.E.S.R., VIEIRA, D.M., BONNA, I.C.F., SILVA, D.A. & LENCASTRE, H. 2007. Characterization of Staphylococcus aureus isolates from buffalo, bovine, ovine, and caprine milk samples collected in Rio de Janeiro state, Brazil. *Applied and Environmental Microbiology,* 73: 3845-3849.
Eighty-four staphylococcal isolates were obtained from milk samples from cows, sheep, goats, and buffalo with subclinical mastitis and from colonization samples from ostriches. The animals were hosted in 18 small dairy herds and an ostrich breeding located in 10 municipalities of the state of Rio de Janeiro, Brazil. Thirty isolates were identified as Staphylococcus aureus by biochemical and molecular techniques and were comparatively characterized by phenotypic and genotypic methods. The molecular characterization by pulsed-field gel electrophoresis (PFGE), spa typing, and multilocus sequence typing (MLST) revealed five clonal types (PFGE A, spa type t359, sequence type 747 [ST747]; PFGE B, spa type t1180, ST750; PFGE C, spa type t605, ST126; PFGE D, spa type t127, ST751; and PFGE F, spa type t002, ST5). None of the isolates harbored the Panton-Valentine leukocidin or exfoliative toxin D gene. The detection of major clone A (in 63% of the isolates) in different herds, among all animal species studied, and in infection and colonization samples evidenced its geographical spread among Rio de Janeiro State and no host preference among the animal species. Comparison with S. aureus from a human origin suggested that all but one clone found in the present study might be animal specific. Â©American Society for Microbiology. All rights reserved.

AIRES-DE-SOUSA, M., PARENTE, C.E., VIEIRA-DA-MOTTA, O., BONNA, I.C., SILVA, D.A. & DE LENCASTRE, H. 2007. Characterization of Staphylococcus aureus isolates from buffalo, bovine, ovine, and caprine milk samples collected in Rio de Janeiro State, Brazil. *Applied & Environmental Microbiology,* 73: 3845-3849.
Eighty-four staphylococcal isolates were obtained from milk samples from cows, sheep, goats, and buffalo with subclinical mastitis and from colonization samples from ostriches. The animals were hosted in 18 small dairy herds and an ostrich breeding located in 10 municipalities of the state of Rio de Janeiro, Brazil. Thirty isolates were identified as Staphylococcus aureus by biochemical and molecular techniques and were comparatively characterized by phenotypic and genotypic methods. The molecular characterization by pulsed-field gel electrophoresis (PFGE), spa typing, and multilocus sequence typing (MLST) revealed five clonal types (PFGE A, spa type t359, sequence type 747 [ST747]; PFGE B, spa type t1180, ST750; PFGE C, spa type t605, ST126; PFGE D, spa type t127, ST751; and PFGE F, spa type t002, ST5). None of the isolates harbored the Panton-Valentine leukocidin or exfoliative toxin D gene. The detection of major clone A (in 63% of the isolates) in different herds, among all animal species studied, and in infection and colonization samples evidenced its geographical spread among Rio de Janeiro State and no host preference among the animal species. Comparison with S. aureus from a human origin suggested that all but one clone found in the present study might be animal specific.

ALI, A.R. & YOUSSEF, A.E. 2003. Bacteriological studies and biochemical parameters of respiratory infection in ostriches. *Veterinary Medical Journal Giza,* 51: 189-203.

AL-NAKHLI, H.M., AL-JUWAID, S.M. & AL-ABOUD, M.A. 2004. A note on a severe Salmonella typhimurium infection in ostrich chicks. *Saudi Journal of Biological Sciences,* 11: 73-78.
Ostrich baby chicks 1-2.5 months, raised in a private farm with capacity of 25 birds in Al-Kharj region south Riyadh. were infected with Salmonella, the mortality was up to 20%. A live sick and dead birds were sent to the poultry disease laboratory for post-mortem examination and bacteria isolation. Salmonella Typhimurium was isolated from liver, Spleen,and Intestines of the infected birds, The birds were treated with Erythromycin (E), and Enrofloxacin(ENO) for five days, but no response showed up to medication,the in-vitro susceptibility test was carried out on the isolated salmonella, the isolates were sensitive to Norfloxacin (NOR), Fosphomycine (FOS), Ciprotril (CIP), Gentamycin (GM), Flumequine (AR), and Apramycin (APR) respectively. Norfloxacin (NOR) was the drug of choice in treating the birds. The isolates were resistant to five antibiotics used in this study were as follows: Ampicillin (AMP), Amoxycillin (AML), Danofloxacin (DF), Doxycyclin (D), and Sulfamethoxazole+Trimethoprim (SXT) respectively.

The birds were recovered after treating them with (NOR) for five days, and no more salmonella was detected post treatment with (NOR).

ANDERSEN, A.A., GRIMES, J.E. & SHIVAPRASAD, H.L. 1998. Serotyping of Chlamydia psittaci isolates from ratites. *Journal of Veterinary Diagnostic Investigation,* 10: 186-188.

BOTES, A., PEYROT, B.M., OLIVIER, A.J., BURGER, W.P. & BELLSTEDT, D.U. 2005. Investigations into mycoplasma infections in South African ostriches. Proceedings of the 3rd International Ratite Science Symposium of the World's Poultry Science Association (WPSA) and 12th World Ostrich Congress, Madrid, Spain, 14th-16th October, 2005.: 211-216.
Mycoplasmas are responsible for respiratory tract infections in mammals and birds. In poultry, these infections are responsible for considerable production losses. Recently, ostriches have been shown to harbour three unique ostrich mycoplasmas. In this study, these mycoplasmas were isolated from ostriches in South Africa and identified using 16S rRNA gene sequencing or detected and identified by specific PCR. An analysis of the disease symptoms that these ostriches exhibit was made and it was found that ostrich mycoplasmas are primarily associated with respiratory disease although they were also found in the lower alimentary tract. The highest incidence of mycoplasma was during a change of seasons. Treatment of ostriches with anti-mycoplasmosis drugs alleviates these symptoms and provides evidence that the three ostrich mycoplasmas are causative organisms of respiratory disease of ostriches in South Africa. The significance of these mycoplasmas in causing respiratory and gut disease in ostriches awaits further study.

CARBAJO, E. 2005. Proceedings of the 3rd International Ratite Science Symposium of the World's Poultry Science Association (WPSA) and 12th World Ostrich Congress, Madrid, Spain, 14th-16th October, 2005. : 402.
This book focuses on ratites' (ostriches, emus, kiwis and Rhea sp.) genetics; chromosome analysis; breeding; reproduction; anatomy; physiology; pharmacology; biochemistry; carcass quality and yield; meat products and quality; product processing; production economics; behaviour; husbandry; nutrition; health; and viral and bacterial diseases. The book is a compilation of articles from scientists and experts on ratites. Each article is coupled with illustrations, tables and graphs, and will be very useful to students, veterinarians, breeders, farm owners, researchers and farm managers.

CATELLI, E. & LAVAZZA, A. 2000. The health of poultry in Italy during the year 2000. *Selezione Veterinaria*, 11: 963-970.
Avian influenza led to large-scale slaughter of flocks, particularly in Veneto and Lombardia. Disease incidence was reduced by stricter management, and by leaving poultry houses empty for a period between batches. Escherichia coli infection remained a problem, but it could be controlled. A table shows Salmonella serotypes isolated from animals in Triveneto during 1999: 25 of 63 S. enteritidis isolates belonged to phage type 4; 37 isolates were from fowls. Marek's disease resulted in 20-30% mortality in Piemonte and Abruzzo. There is brief mention of diseases of pigeons, ostriches, guinea-fowl, ducks, geese, pheasants and quail.

COOPER, R.G. 2005. Bacterial, fungal and parasitic infections in the ostrich (Struthio camelus var. domesticus). *Animal Science Journal,* 76: 97-106.
The ostrich is susceptible to microorganisms of bacterial, fungal and parasitic origin. Anthrax, caused by Bacillus anthracis, is dangerous to other livestock and humans. Salmonella is transmitted from rodents or wild bird reservoirs. Pausterellosis caused by Pasteurella multocida results in air sac infections in ostriches. Colibacillosis is caused by Escherichia coli. Tuberculosis caused by Mycobacterium avium, is very rare in ostriches. Aspergillosis principally afflicts chicks. Zygomycosis, a secondary fungal infection of the upper gastrointestinal tract, is caused by Basidia, Mucor and Rhizopus. Leucocytozoon struthionis and Plasmodium spp. are harmless protozoa transmitted from flying arthropods. The tapeworm, Houttuynia struthionis, is dangerous in young ostriches. The adult ratite fluke (Philophthalmus gralli) is transmitted to ostriches following ingestion of infected freshwater crustaceans. Tick infestations of ostrich skin in Africa include Amblyomma spp.,

Haemaphysalis punctata, Hyalomma spp., Rhipicephalus turanicus and Argus spp. The ostrich quillmite (Pterolichus bicaudatus) and louse (Struthioliperus struthionus) may lower skin and leather quality via pruritis and/or excessive preening and feather loss. Nematode infections are rare.

DONELEY, R.J.T., GIBSON, J.A., THORNE, D. & COUSINS, D.V. 1999. Mycobacterial infection in an ostrich. *Australian Veterinary Journal,* 77: 368-370.

ELFAKI, M.G., ABBAS, B., MAHMOUD, O.M., HAROUN, E.M. & ABDEL-MAGIED, E.M. 2002. Septicaemic pasteurellosis in ostriches (Struthio camelus) in central Saudi Arabia. *Veterinary Journal,* 163: 218-221.

GARCIA, A., LECLEAR, C.T. & GASKIN, J.M. 2001. Mycobacterium avium infection in an ostrich (Struthio camelus). *Journal of Zoo and Wildlife Medicine,* 32: 96-100.

HAJIBABAEI, A., MOSAVI, S.M. & VAHEDI, H. 2005. Ostrich breeding in Iran. World Poultry Science Association (WPSA), Beekbergen, Netherlands, Proceedings of the 3rd International Ratite Science Symposium of the World's Poultry Science Association (WPSA) and 12th World Ostrich Congress, Madrid, Spain, 14th-16th October, 2005 : 359-361.
The beginning and development of the commercial ostrich breeding; production rate; breeding problems; viral and bacterial diseases; marketing and distribution of products; and the future of ostrich industry in Iran are discussed.

HEMALATHA, S., GOVINDARAJAN, R., MURALI MANOHAR, B., VENGADABADY, N. & PURUSHOTHAMAN, . 2006. Omphalitis in ostrich chicks. *Indian Veterinary Journal,* 83: 452-453.

HERRAEZ, P., RODRIGUEZ, F., ESPINOSA DE LOS MONTEROS, A., ACOSTA, B., JABER, J.R., CASTELLANO, J. & CASTRO, A. 2005. Fibrino-necrotic typhlitis caused by Escherichia fergusonii in ostriches (Struthio camelus). *Avian Diseases,* 49: 167-169.
Two adult ostriches developed anorexia, prostration, and severe haemorrhagic diarrhoea, dying 24 hr after the onset of clinical signs. On postmortem examination, the cecal mucosa showed locally extensive areas of haemorrhages and fibrino-necrotic typhlitis with a white-yellowish material covering the mucosal surface. Multiple serosal petequial hemorrhages and fibrinous peritonitis were present. Histologic examination revealed an intense mononuclear infiltration in the lamina propria and submucosa of the cecum and extensive superficial necrosis associated with fibrin and serocellular deposits. Several gram-negative bacterial colonies were observed within the necrotic areas. Samples from intestinal lesions were collected, and pure growth of Escherichia fergusonii was obtained. Escherichia fergusonii is a member of Enterobacteriaceae, closely related to Escherichia coli and Shigella sp., established as a new species of the genus Escherichia in 1985. In veterinary medicine, E fergusonii has been reported in calves and sheep from clinical cases suggestive of salmonellosis. To our knowledge, this report represents the first description of E fergusonii associated with enteritis in ostrich.

KANYARI, P.W.N., NGATIA, T.A., MATHIU, P.M., OYEJIDE, A. & SRIVASTAVA, K.K. 2005. Some causes of poor performance and chick mortality in farmed ostriches in Alabama [USA] and Kenya. *The Kenya Veterinarian,* 28: 6-10.
Commercial ratite farming is rapidly becoming a desirable alternative source of profitable meat production among small holder farmers. However, ratite ranching, particularly ostrich production is severely constrained by a very high chick mortality rate (up to 40%). To help rural farmers, including those in developed countries such as the United States, gain a successful foothold in this potentially lucrative farming enterprise, the causes of chick mortality must be identified and controlled. The present collaborative study was designed to characterize and compare causes of mortality in chicks in small holder ratite farms in Macon

and adjoining counties of Alabama and some selected localities in Kenya between 1997 and 2000. The study established that, in both Alabama [USA] and Kenya, ostrich farmers incur losses of considerable magnitude from a wide range of causes, some of which could not be established. Losses were experienced right from the embryonic stages whereby embryos developed poorly causing death before hatching. In USA, hatchability was 72% while in Kenya, hatchability was only 56% on average. In Kenya, a high mortality rate in the early weeks of life (<3 weeks) [27-40%] was noted. Pathogens isolated at postmortem from inflamed tissues and septic yolk sacs were mainly common bacteria such Enterobacter sp., Escherichia coli, Staphylococcus, Streptococcus sp., Pseudomonas sp., Corynebacterium sp. and Clostridium sp. Other causes of death were impaction, dehydration, generalized oedema, joint infection and non-specific peritonitis. Limb deformities constituted the main cause of culling among the chicks. Histopathological lesions were observed in virtually all organs examined including the abdominal, thoracic and even the brain tissue. Lesions associated with circulatory disturbances were common. Bacteriological analysis of feeds in Kenya showed that bacterial contamination of feed, especially fish meal, was quite possibly a cause of infection.

KAZEEM, H.M., ADENE, D.F., SA'IDU, L., ABDU, P.A., WAKAWA, A.M., KWANASHIE, C.N., MAMMAN, P.H., ADAMU, J., FATIHU, M.Y. & JOANNIS, T. 2008. Haemolytic E. coli associated with the outbreaks of avian influenza [H5N1] in Nigeria. *Journal of Animal and Veterinary Advances,* 7: 217-220.
The avian influenzavirus (AI) strain H5N1 causing an outbreak with very high mortality in 2 commercial poultry farms (with chickens, turkeys, geese, ducks and ostriches) in Nigeria [date not given] was subjected to further laboratory investigations to document all contributory etiological factors. Tissues from flocks on the farms located over 200 km apart were sampled for bacteriology. Haemolytic Escherichia coli and an unidentified Gram variable rod were isolated from the first farm; Pasteurella haemolytica and haemolytic E. coli were isolated from the second farm. Antibiotic susceptibility test showed haemolytic E. coli was resistant to 6, partially resistant to 3 and fully susceptible to enrofloxacin (Tarivid). P. haemolytica was resistant to 5 and susceptible to 3 antibiotics. The unidentified Gram variable pleomorph was sensitive to 10 antibiotics. The isolation of haemolytic E. coli in avian influenza outbreaks with a high degree of antibiotic resistance is presented.

KWON, YONGKUK. LEE,YOUNGJOO.MO, INPIL. 2004. An outbreak of necrotic enteritis in the ostrich farm in Korea. *Journal of Veterinary Medical Science,* 66: 1613-1615.
An acute disease with high mortality occurred in the ostrich farm and characterized by depression, severe diarrhea and sternal recumbency. Four dead ostriches of the farm were submitted to the National Veterinary Research & Quarantine Service, and diagnosed as necrotic enteritis. In the gross and histopathological examination, extensive diffuse fibrinonecrotic enteritis was found in the small intestine, especially jejunum. Clostridium perfringens was isolated from a pure culture from the duodenum and jejunum of these birds. Based on our current knowledge, this is the first report of an outbreak of necrotic enteritis in the ostrich in Korea.

LAO, Z. 2005. The growing ratite industry in China. Zhang Lao; Carbajo, E.; World Poultry Science Association (WPSA), Beekbergen, Netherlands, Proceedings of the 3rd International Ratite Science Symposium of the World's Poultry Science Association (WPSA) and 12th World Ostrich Congress, Madrid, Spain, 14th-16th October, 2005, : 377-380.
The ratites referred as the flightless birds are subdivided into four types: Struthioniformes; Casuariiformes, Rheiformes and Apterygiformes. This article discusses the origin of ratites; its relationship with humans; ratite products; development of ratite industry; breeding problems; nutrition; management; incubation; diseases; chick rearing and the current resolutions and researches regarding the ratites in China.

LEY, E.C., MORISHITA, T.Y., HARR, B.S., MOHAN, R. & BRISKER, T. 2000. Serologic survey of slaughter-age ostriches (Struthio camelus) for antibodies to selected avian pathogens. *Avian Diseases,* 44: 989-992.

Serum samples from 163 slaughter-age ostriches (Struthio camelus) in Ohio and Indiana were tested for antibodies to avian influenza virus (AIV), Newcastle disease virus (NDV), paramyxovirus (PMV) 2, PMV3, PMV7, infectious bursal disease virus (IBDV), Bordetella avium, Mycoplasma synoviae, Mycoplasma gallisepticum, Ornithobacterium rhinotracheale, Salmonella pullorum, Salmonella gallinarum, and Salmonella typhimurium. One ostrich had antibodies to AIV H5N9, 57% of the ostriches had antibodies to NDV, four ostriches had antibodies to both NDV and PMV2, and one ostrich had antibodies to NDV, PMV2, PMV3, and PMV7. None of the ostriches had antibodies to IBDV, B. avium, M. synoviae, M. gallisepticum, O. rhinotracheale, S. pullorum, S. gallinarum, and S. typhimurium. This is the first report of antibodies to avian influenza and PMV7 in ostriches in the United States.

LOPES, M.A.E., FERREIRA, C.S.A. & FERREIRA, A.J.P. 2005. Identification of enteric bacteria from ostrich and their use as a competitive exclusion product in the control of enteritis. World Poultry Science Association (WPSA), Beekbergen, Netherlands, Proceedings of the 3rd International Ratite Science Symposium of the World's Poultry Science Association (WPSA) and 12th World Ostrich Congress, Madrid, Spain, 14th-16th October, 2005, : 223-227.

Commercial exploring of ostrich ranching in Brazil has been growing significantly. Due to this, several sanitary problems have appeared, especially enteric complications such as enteritis and diarrheas resulting from different agents. For this study, various bacterial species from the enteric tract of adult ostriches were isolated, like Escherichia sp., Bifidobacterium sp., Propionibacterium sp., Eubacterium sp., Lactobacillus sp., Ruminococcus sp., Bacillus sp., Bacleroides sp. and Enterococcus sp. The bacteria were fermented and used as an experimental competitive exclusion product called ECOS. Experimental and field trials were carried out to demonstrate ECOS efficacy. For experimental challenge purpose, day-old chicks (Gallus gallus) and ostrich chicks (Struthio camelus) were divided into three groups, treated, positive control and negative control. The birds were treated with ECOS on the first day of age and were challenged 24 hours after treatment with Salmonella Typhimurium strain 1769 NR. Chicks and ostriches were challenged with a concentration of 1Ã—104 CFU/bird and 1Ã—105 CFU/bird, respectively. ECOS reduced the infection of Salmonella typhimurium from 60% to 0% in chicks, and from 40% to 0% in ostrich chicks. ECOS reduced Salmonella typhimurium, excretion in chicks and newborn ostriches infected artificially. In field conditions, ECOS also significantly reduced the enteritis cases of mortality in ostriches. In farm 1, it was reduced from 57.14% to 41.37%, and in farm 2 from 20% to 12.90%. Another aspect observed in ostriches treated on field was the improved absorption rate of the yolk sac, as well as improved weight gain. Weight gain increased from 53.77 g/day to 80.23 g/day. ECOS showed to be an important tool for reducing enteric complications and for the improvement of ostriches rearing.

MARTINS, N.R.S., HORTA, A.C., SIQUEIRA, A.M., LOPES, S.Q., RESENDE, J.S., JORGE, A., R.A., MARTINS, N.E., FERNANDES, A.A., BARRIOS, P.R., COSTA, T.J.R. & GUIMARAES, L.M.C. 2006. Macrorhabdus ornithogaster in ostrich, rhea, canary, zebra finch, free range chicken, turkey, guinea-fowl, columbina pigeon, toucan, chuckar partridge and experimental infection in chicken, Japanese quail and mice. *Arquivo Brasileiro de Medicina Veterinaria e Zootecnia,* 58: 291-298.

Since 2000, Macrorhabdus ornithogaster "megabacteriosis" has been diagnosed in the avian diseases laboratory in a diversity of avian species and varied spectrum of disease. The disease in some species (chickens, turkeys, guinea fowls) was clinically characterized by emaciation, prostration, loss of appetite, cachexia and death, with a typically chronic course. A more acute disease was observed in finches (canary-Serinus and zebra-Taeniopygia) and budgerigars (Melopsittacus undulatus). The large rod shaped organism, visible from 100 times magnification, with and without staining, could be detected in sick and also in reasonably normal individuals of some species, such as chickens, turkeys, quails and pigeons. In rheas (Rhea americana), ostriches (Struthio camelus), canaries, zebra-finches, guinea-fowl (Numida meleagris) and budgerigars. The disease was severe, causing to up to 100% mortality. The infection could be detected in some species along with other infectious or disease problems,

such as endoparasites (helminths, Coccidia) and ectoparasitism (order Mallophaga or/and order Acarina). The cultivation of M ornithogaster was successfully achieved in solid and liquid media, originated from chickens (four isolates), guinea fowl (I isolate), chuckar partridge (I isolate) and canary (I isolate). A very interesting finding at microscopy was motility of M ornithogaster, as detected both in cultures obtained on agar for pathogenic fungi and passaged into thioglycolate broth, as well as on samples observed in wet preparations from in vivo. Differences in colony aspects were noted among the isolates. Experimental infections were attempted in chicken and Japanese quail, using a chicken isolate, allowing the detection of the organism in the proventriculus and liver in apparently normal birds. One chicken isolate was injected intraperitoneally in Balb/c mice and resulted in 100% mortality.

NASEF, S.A., BADR, J.M. & TANIOS, N.I. 2003. Isolation, identification and pathogenicity of some bacterial agents isolated from ostriches. *Assiut Veterinary Medical Journal,* 49: 194-206.
A total of 242 samples from ostriches at different ages were examined for the presence of bacterial infections (Egypt). Escherichia coli, Proteus spp., Pseudomonas aeruginosa, Pasteurella haemolytica, P. multocida, Aeromonas spp. and Shigella spp. were isolated in 40.49, 22.72, 17.76, 10.74, 6.61, 0.82 and 0.82%, respectively, of the samples. Most of the bacterial agents isolated from the ostriches and the environment were pathogenic for both chicken and mice.

PANDEY, G.S., ZIEGER, U., NAMBOTA, A., NOMURA, Y., KOBAYASHI, K. & MWEENE, A. 2001. Pneumonitis due to Pseudomonas aeruginosa in an adult ostrich in Zambia. *Indian Veterinary Journal,* 78: 39-42.
A case of pneumonitis, caused of P. aeruginosa, in an adult male ostrich in Zambia, Africa is reported [date not given]. The animal had severe greenish diarrhoea, fever, convulsion, respiratory distress and dehydration. It was treated orally with Baytril (5 mg/kg, body weight) and vitamin E for 3 days. Slight improvement was observed and restlessness, respiratory distress and nervous signs were still present despite of treatment. After one week of sickness, the ostrich died on 20 January 1996. Smear examination revealed gram negative rods and culture of specimen demonstrated pure growth of P. aeruginosa.

PERELMAN, B. 2004. Control and prevention of hatchery related infectious diseases in ostriches. Proceedings of the 11th Ostrich World Congress, Island Great Brijun, Croatia, 15-17 October 2004. : 63-65.
This article discusses incubator and hatchery hygiene and egg handling and disinfection procedures to prevent contamination and infection of ostrich eggs and embryos by bacteria and fungi.

SANCHEZ, M.E. & MADEIROS, C.A. 2009. Achievements of research in the field of ostrich and rhea farming: health, disease and the importance of biosecurity in the ostrich farm. IN Animal production and animal science worldwide: WAAP book of the year 2007 : 145-148.

SHAN SONGHUA,. XIE AIZI,. WANG YUNYUN,. WU BAOGUAN,. HU YONGQIANG,. LIU XUEZHONG,.MAO SHAOHUA. 1998. Isolation and identification of Enterococcus faecalis in imported ostrich. *Shanghai Nongye Xuebao,* 14: 87-89.

SHIVAPRASAD, H.L. & WOOLCOCK, P.R. 2005. Viruses, bacteria, fungi and protozoa associated with high mortality in a flock of rhea chicks. Proceedings of the 3rd International Ratite Science Symposium of the World's Poultry Science Association (WPSA) and 12th World Ostrich Congress, Madrid, Spain, 14th-16th October, 2005 : 201.

SIEMER, B.L., NIELSEN, E.M. & ON, S.L.W. 2005. Identification and molecular epidemiology of Campylobacter coli isolates from human gastroenteritis, food, and animal sources by amplified fragment length polymorphism analysis and Penner serotyping. *Applied and Environmental Microbiology,* 71: 1953-1958.

Campylobacter coli is an infrequently studied but important food-borne pathogen with a wide natural distribution. We investigated its molecular epidemiology by use of amplified fragment length polymorphism (AFLP)-based genotyping and Penner serotyping. Serotype reference strains and 177 Danish isolates of diverse origin identified by routine phenotyping as C. coli were examined. Molecular tools identified some 12% of field isolates as Campylobacter jejuni, emphasizing the need for improved identification methods in routine laboratories. Cluster analysis of AFLP profiles of 174 confirmed C. coli isolates revealed a difference in the distribution of isolates from pig and poultry (chicken, duck, turkey, and ostrich) species and indicated the various poultry species, but not pigs, to be likely sources of human C. coli infection. A poor correlation was observed between serotyping and AFLP profiling, suggesting that the former method has limited value in epidemiological studies of this species.

SONGER, J.G. 2004. The emergence of Clostridium difficile as a pathogen of food animals. *Animal Health Research Reviews* 5 (1): 321-326.
Clostridium difficile causes pseudomembranous colitis in humans, usually after disruption of the bowel flora by antibiotic therapy. Factors mediating the frank disease include the dose and toxigenicity of the colonizing strain, its ability to adhere to colonic epithelium, the concurrent presence of organisms that affect multiplication and toxin production or activity, and the susceptibility of the host. Toxins A (an enterotoxin) and B (a cytotoxin) play the major role in pathogenesis and the detection of toxins in gut contents is the gold standard for diagnosis. Disease in horses takes the form of often-fatal foal hemorrhagic enteritis. Nosocomial, antibiotic-associated, disease is increasingly common in adult horses. Enteric clinical signs are reported in ostriches, companion animals and recently calves. Clostridium difficile colitis is now a common diagnosis in neonatal pigs in the USA and elsewhere. Clinical features include onset at 1-5 days of age, sometimes with dyspnea, mild abdominal distension and scrotal edema, and commonly with yellow, pasty diarrhea. There is mesocolonic edema grossly, with microscopic diffuse colitis, mucosal edema, crypt distension, epithelial necrosis and superficial mucosal erosion. Neutrophil infiltration of the lamina propria is common, and fibrin and numerous rod-shaped bacteria are observed on the surface. About two-thirds of litters and one-third of piglets will be affected (based upon positive toxin tests), although this appears to vary with the season. The case fatality rate is probably low if considering only direct effects of C. difficile infection. The significance of toxin-positive non-diarrheic pigs and the nature of the interaction of toxins A and B with enterocytes are unknown. Given the widespread occurrence of the disease, there is substantial effort to develop immunoprophylactic products.

SPEER, B. 2006. Ratite medicine and surgery. Proceedings of the North American Veterinary Conference, January 7-11, 2006, Orlando, Florida. Small Animal edition, vol. 20 : 1593-1597.

TISLJAR, M.,SIMPRAGA, B., NOVAK, I.L., SAVIC, V., BECK, R., MARINCULIC, A., KRIVEC, G., KRSTULOVIC, F. & BALENOVIC, M. 2003. Most significant ostrich diseases confirmed in Croatia over the period 2000-2002. Croatian Veterinary Institute, Poultry Section. V.Simpozij. Peradarski Dani 2003. Zbornik Radova, Porec, Hrvatska, 14-17 svibnja, 2003. : 188-192.

A review is given of the major problems concerning the pathology of the more common diseases of farmed ostriches in Croatia over the period 2001-2002. Special mention is made of the diseases occurring due to technology errors (stomach impaction; 'generalized chick oedema'; ascites-pulmonary hypertension syndrome, PHS), bacteriological diseases ('baby-chick' diseases/omphalitis, colisepsis, coli-enterotoxaemia) and parasitological disease (libyostrongylidosis or 'rotten stomach' which is caused by Libyostrongylus douglassi).

VERWOERD, D.J. 2000. Ostrich diseases. *Revue Scientifique et Technique - Office International des Epizooties,* 19: 638-661.

VIEIRA-DA-MOTTA, O., SILVEIRA, L.S., TEIXEIRA, G.N., CARDINOT, C.B., LEMOS, L.S., SILVA, R.S.T. & BRANCO, A.T. 2008. Microbiological and histological diagnosis in mortality of ostrich (Struthio camelus). *Arquivo Brasileiro de Medicina VeterinÃ¡ria e Zootecnia,* 60: 1014-1016.
Young ostriches with history of lassitude and inappetence, followed by sudden death are

reported at the Animal Health Laboratory for disease diagnosis. Postmortem examination showed haemorrhage, altered vitelline sac content, necrotic foci in the small intestine and necrotic pleuropneumonia with psammomatosus bodies in the lung parenchyma. Bacterial culture showed Escherichia coli, Pseudomonas aeruginosa, Klebsiella pneumoniae, Serratia marcescens, Enterobacter agglomerans and Pseudomonas mendocina. It is suggested that the birds are affected with septicaemia due to Enterobacteriacea infection.

WILLEMS, R.J.L., TOP, J., VAN SANTEN, M., ROBINSON, D.A., COQUE, T.M., BAQUERO, F., GRUNDMANN, H. & BONTEN, M.J.M.2005. Global spread of vancomycin-resistant Enterococcus faecium from distinct nosocomial genetic complex. *Emerging Infectious Diseases,*11(6).June : 821-828.

Vancomycin-resistant enterococci (VRE) have caused hospital outbreaks worldwide, and the vancomycin-resistance gene (vanA) has crossed genus boundaries to methicillin-resistant Staphylococcus aureus. Spread of VRE, therefore, represents an immediate threat for patient care and creates a reservoir of mobile resistance genes for other, more virulent pathogens. Evolutionary genetics, population structure, and geographic distribution of 411 VRE and vancomycin-susceptible Enterococcus faecium isolates, recovered from human and nonhuman sources and community and hospital reservoirs in 5 continents, identified a genetic lineage of E. faecium (complex-17) that has spread globally. This lineage is characterized by 1) ampicillin resistance, 2) a pathogenicity island, and 3) an association with hospital outbreaks. Complex-17 is an example of cumulative evolutionary processes that improved the relative fitness of bacteria in hospital environments. Preventing further spread of this epidemic E. faecium subpopulation is critical, and efforts should focus on the early disclosure of ampicillin-resistant complex-17 strains.

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