A. Gregorio Rosales

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The Career of A. Gregorio Rosales

I was born in Mexico City in 1956, but my birth certificate was issued in Texcoco de Mora, located in the State of Mexico, approximately 30 miles northeast of Mexico City. In the pre-Hispanic era, this was a major Aztec city on the shores of Lake Texcoco. I was the fourth of five children. I received my middle name after my paternal Grandfather, which stuck when my P.E./soccer coach called me Gregorio or Goyo (the short version) during class and games against other schools. My first name, Arturo, was only used by my family and a few friends.

I grew up in rural farmland near Texcoco, where I spent my first fifteen years on the family's chicken and pig farm. I was mesmerized by food-producing animals. Growing up on a farm, I had many chores, but my favorites were vaccinations (all individual applications), medications, and surgeries (orchiectomy of piglets). In middle school, I decided to be a veterinarian because:

- My father was an agriculture engineer specializing in animal husbandry and a former professor at Chapingo Autonomous University in the State of Mexico. Throughout my childhood, he instilled a passion for farm animals and a philosophy of best management practices to allow animals to perform at their full genetic potential. The veterinary school (a five-year program with a combined medicine and animal husbandry curriculum) became my natural choice. Strangely

enough, there used to be a professional rivalry between agriculture engineers and veterinarians. Fortunately, my father did not mind that my second oldest brother and I became veterinarians. (At least he never mentioned it to us.)

- Dr. Alejandro Cuadra German, a renowned clinician and professor at the National Autonomous University of Mexico (UNAM), visited our farm in the late sixties to examine a floor-raised laying pullet flock experiencing severe mortality due to tumoral disease and coccidiosis (before the advent of Marek's diseases vaccines). Afterward, during a casual conversation, Dr. Cuadra saw my collection of pre-Hispanic clay and obsidian (volcanic rock) artifacts that I found during long walks in the surrounding farmland. Dr. Cuadra helped me classify these artifacts according to different cultures (Teotihuacan, Aztec, Toltec, Olmec, etc.). He was an expert in pre-Hispanic and Colonial Mexican Art. After listening to and learning about chickens and art from Dr. Cuadra, he became one of my role models.
- My second oldest brother (Juan Manuel) went to vet school at UNAM and became a poultry veterinarian. His degree thesis (1970) was on a staining technique to identify Marek's-induced neoplastic cells under the direction of the famous Professor Dr. Aline Schunemann Hofer de Aluja (Emeritus Professor of animal pathology, researcher, founder of the Mexican Academy of Veterinary Medicine, and advocate of incorporating animal husbandry and animal welfare in the curriculum of veterinary schools). Initially, Juan Manuel worked for Vineland Laboratories as a member of the technical services team and moved to Guadalajara, Jalisco. I visited laying and broiler farms in the States of Jalisco, Michoacan, and Nayarit every summer with him. My brother was a skilled clinician and very supportive of my career aspirations.

While growing up on the family farm, we constantly feared that our laying flocks would get exposed to Exotic Newcastle Disease (END). We learned to identify early symptoms (such as sneezing, depression, and corneal opacity) as precursors to mortality increases, chronic respiratory disease (CRD) and drops in egg production. Despite the wide use of live vaccines with the La Sota strain, this disease was common during months with high winds and dust storms. In those days, we relied on eye-drop vaccinations and later a combination of live La Sota via eye-drop and intramuscular injections (to boost immunity levels). Years later, after my family was forced out of business by vertical integration, inactivated oil-emulsion vaccines became commercially available. These vaccines were a significant step forward in the protection against END. Interestingly, in 1973, Dr. Antonio Berna (another veterinarian working for Vineland) submitted sick birds from his family's farm (approximately ten miles from ours) to the poultry diagnostic laboratory of the Veterinary School at UNAM, where a strain of velogenic viscerotropic Newcastle disease virus (vvNDV) was isolated and named the Chimalhuacán strain. This virus has been used ever since as the challenge strain in vaccine protection studies.

When I was in Middle School, a large area of our farm was set up with floor pens to conduct anticoccidial drug field trials in broilers. Dr. Ignacio Ortega from Merck Sharp & Dohme (MSD), Mexico, rented this area for several years. I enjoyed watching him collect data on body weight, mortality, skin pigmentation, feathering, litter conditions, and intestinal lesion scoring. I liked listening to him talk about the ongoing research by

famous investigators (in Europe and the USA) to isolate and develop a vaccine against Marek's disease (MD). Dr. Ortega mentioned MSD had a promising vaccine (1969) containing a live herpes virus from turkeys propagated in cell cultures and kept frozen in liquid nitrogen until its subcutaneous administration in day-old chicks. Although I was fascinated to hear about this incredible scientific achievement, I listened to some friends of my father (also chicken growers) say this "fragile vaccine" would never catch on in our industry. Vaccines against MD became commercially available and widely used by 1971, and I saw first-hand how these saved the industry and contributed to its phenomenal growth.

Veterinary School and Poultry Training

In 1975 I registered directly out of high school into the Veterinary School at UNAM, Mexico. This school is the only one in the country accredited by the American Veterinary Medical Association (2011). My goal of becoming a poultry veterinarian was unusual as most of my classmates and friends were interested in companion or large animals. I applied to the Department of Avian Medicine and Poultry Production (DPAA) during my third year to pursue this goal. Dr. Angel Mosqueda was the Department Head. I began the established training program with washing and sterilizing lab glassware. Every three months after, I rotated into the clinical bacteriology, virology, and serology sections. My last rotation was in the necropsy room and preparation of diagnostic reports. During my fifth and final year, I remained in this section while meeting the required six months of social service work. I took additional responsibilities in the diagnostic laboratory and was a teaching assistant for Dr. Armando Antillon (Professor of Avian Medicine at undergraduate and graduate levels).

At the start of my training, one of my favorite memories was helping the lab technician (Mr. Gilberto Alaves) during a hectic week of washing and sterilizing glass beakers, test tubes, Petri dishes, and pipettes. That week a visiting virologist, Dr. Pedro Villegas from the U. of Georgia (UGA), taught diagnostic virology techniques to senior students and laboratory staff. At one point, Mr. Alaves (displeased by the massive flow of dirty glassware) suggested getting "Dr. Pedrito" to help us in the washroom. Who would have known that years later, I would become a graduate student at the U. of Georgia and work with Dr. Villegas?

Dr. Armando Antillon was my mentor and directed my thesis research project on the first detection of antibodies in laying and breeding hens against the adenovirus-causing Egg Drop Syndrome (EDS) in Mexico. We attempted the isolation of the virus in primary embryonic hepatic cell cultures with the assistance of Dr. William Baxendale (a well-known virologist from the UK) and the sponsorship of Intervet, Mexico. This work was essential to getting official approval for importing inactivated vaccines against the disease. While writing my thesis, Dr. Pedro Villegas provided us with helpful technical assistance on serological techniques and the interpretation of results. Dr. Antillon and I reported our findings at a joint meeting of the National Association of Poultry Specialists (ANECA) and the Western Poultry Disease Conference (WPDC) in Acapulco, Guerrero, Mexico (1980). At this meeting, I met EDS experts and virologists such as Doctors

Antonio Zanella (Italy) and Brian McFerran (Northern Ireland), who I visited years later, working as a broiler primary breeder veterinarian.

During my early vet school years, I attended a meeting sponsored by Vineland Laboratories in Mexico City. Dr. Jack T. Tumlin (Director of Technical Services in the US) was the keynote speaker. During the reception following the talks, I conquered my shyness and, in the best English I could muster, told Dr. Tumlin I was interested in pursuing postgraduate studies at a poultry medicine program in the US. He smiled and told me the best program was the Master in Avian Medicine (MAM) at UGA and gave the names of Doctors Stanley Kleven and Pedro Villegas. I learned years later that Dr. Tumlin not only worked at UGA (as Head of the Section on Avian Medicine), but he spearheaded the creation of the MAM program. After meeting Dr. Tumlin, as the famous song goes, "I had Georgia on my mind."

My two-year period of poultry training at the DPAA, UNAM, was very fruitful and put me on an excellent path to fulfilling my dream of becoming a poultry veterinarian. I will be forever thankful to professors Armando Antillon, Angel Mosqueda, Jose Antonio Quintana, and laboratory instructor Juan Carlos Morales for their guidance and support. I have great memories of my classmates and colleagues, Mario Padron, Bernardo Lozano, Lorenzo Tlacomulco, Leos Montiel, and Gabriel Galvan. Graduating from Veterinary School at UNAM (1979) was a lifelong dream, and I will always be grateful to that institution. Many professors provided valued instruction and guidance, which allowed me to make the best of this experience. Ultimately, my work and dedication were rewarded by graduating the Valedictorian of my class (receiving the Gabino Barreda Medal. Award named after the illustrious physician, educator, and Mexican philosopher) and earning my veterinary degree with honors. I must highlight that these achievements would not have been possible without the loving support of my parents and siblings. My parents taught me the humility and work ethic that has been a stimulus during my entire life. I will never forget the day when I showed my mom my diplomas, and she said, "Congratulations! Now you are on your own. Keep working hard and be kind."

Practicing Veterinarian in the Broiler Industry

My first job offer came from Dr. Jesus Estudillo Lopez, an internationally recognized ornithologist with an outstanding career in preserving endangered species, poultry medicine, and broiler production. Until his passing in 2010, his private collection of over 300 bird species at the farm, "La Siberia," known today as "El Nido" (Ixtapaluca, State of Mexico), was one the largest and most diverse private bird collections in the world, particularly for its unique specimens of the Cracidae Family. As a staff veterinarian in Dr. Estudillo's company (Cremi-Pollo), I was responsible for broiler breeder farms (Chalco, State of Mexico) and a broiler hatchery (Ticuman, Morelos). My first two years in practice were full of varied experiences as a field veterinarian and manager. It was a terrific experience, and I will always be indebted to Dr. Estudillo for the opportunity to work for him, his advice, and the private tours of his famous bird collection. While working at this company, I collaborated closely with my former classmate and longtime friend, Dr. Mario Padron, who was responsible for broiler farms. Together we examined flocks, brainstormed constantly, and developed strategies to control diseases such as

END, viral arthritis, infectious laryngotracheitis, infectious bursal disease (IBD), *Mycoplasma gallisepticum* (MG), mycotoxicosis, colibacillosis, and ascites syndrome among others.

I have great memories of my time working in the Mexican broiler industry. Unfortunately, a sobering experience was also while visiting a 14-day-old broiler farm near Chicoloapan de Juarez, State of Mexico, with Dr. Mario Padron. The flock had been previously diagnosed with airsaculitis caused by MG and was being treated with antibiotics. A decision was made to delay vaccination against ND with the La Sota strain to avoid a harsh post-vaccinal reaction that could have exacerbated the MG infection. As we arrived, we learned that trucks carrying birds to the processing plant had driven on the road next to the farm a week earlier. Upon entering the most severely affected house (where 24,000 birds had been placed), we heard an eerie silence; dead birds blanketed the litter, and piles of birds were visible throughout the house. This dramatic episode demonstrated what END could do to susceptible birds. After a few minutes, I went outside and wiped away tears, overwhelmed by such devastation. Dr. Padron was equally affected. Interestingly, several years later, Dr. Benjamin Lucio (who was back at UNAM after obtaining his Ph.D. degree from Cornell University) and Jaime Beltran (senior vet student at the time) isolated a strain of very virulent infectious bursal disease virus (vvIBDV) from birds at the same farm.

Master of Science in Medical Microbiology

During the Fall of 1981, I was awarded a scholarship loan by the National Council of Science and Technology (CONACYT), which allowed me to enroll in the master's Program in Medical Microbiology and work with Dr. Pedro Villegas at the Poultry Diagnostic and Research Center (PDRC), College of Veterinary Medicine, UGA. Initially, I wanted to register for the MAM program. However, only three students were accepted every year and had already been selected months in advance. Dr. Villegas advised me to enter the Medical Microbiology program (in conjunction with the Department of Medical Microbiology at the Veterinary School). This program provided me with a broader academic experience and the opportunity to stay at PDRC longer, conduct a research thesis project, and increase my chances of getting an academic position back at UNAM in Mexico. Dr. Villegas encouraged me to take the courses required for the MAM program and participate in necropsy sessions and field trips with the MAM students. I was fortunate to have Doctors John Glisson, James Dawe, and Edwin Odor as my classmates and get additional training from Doctors Richard Davies, Kenneth Page, and Stanley Vezey (professors responsible for PDRC's clinical work and farm visits). Other classmates from the Medical Microbiology program who became good friends were Bertha Perez-Castelan (Mexico) and Luis Fernando Andrade (Venezuela).

Working with Dr. Villegas and being a student at PDRC was everything I had hoped for. I found a rich academic environment, a prestigious avian medicine program, an active diagnostic laboratory with a constant flow of field cases, and thought-provoking weekly clinical rounds. PDRC was a heaven of learning opportunities in an exceptionally professional, welcoming, and inclusive atmosphere. In addition, two events organized by Dr. Villegas (a Course on Laboratory Diagnosis of Avian Diseases and an International

Seminar on Avian Pathology) allowed me to develop new skills, such as translating the proceedings from English into Spanish and collaborating as a translator during live presentations. Also, I collaborated for a few years in the translation of the summaries for the journal Avian Diseases. Learning these skills (thanks to Dr. Villegas' coaching) was very helpful for my professional development and helped me immensely during my entire career. In 1990 I became a charter-honorary member of the newly created MAM Alumni Association, a distinction I treasure as it exemplifies the acceptance of my PDRC peers.

With Doctors J.C. McKay, S.H. Kleven, J.R. Glisson, C.L. Hofacre and P. Villegas at PDRC supporting the creation of the Caswell Eidson Chair in Poultry Medicine.

I proudly remember Dr. Caswell Eidson, who taught the MD part of Dr. Villegas' Avian Virology Class. One evening I was at the lab going through PDRC's filing cabinets of reprints of papers published by PDRC's faculty and graduate students (an ancient activity in today's digital world) looking for an original article. Suddenly, I was startled by Dr. Eidson's towering presence and the smoke of his Churchill size cigar. Coincidentally, I was looking for one of his papers on the effect of adding antibiotics in Marek's disease vaccine diluents. He found the paper for me, and I told him I liked the aroma of his cigar. He instantly gave me one, lit it and asked me to come to his office. I stayed with him, discussing the history of Marek's disease and vaccines past midnight. It was a fascinating one-on-one experience listening to a pioneer in MD vaccine development and learning about his ongoing research to propagate and harvest MD and IBD viruses in the same tissue cultures. The resulting cigar-induced migraine lasted for two days; it was worth it. Sadly, during my last year in the master's program, Dr. Eidson departed life too soon. In the late 1990's Dr. J. C. McKay and I, presented a donation on behalf of Aviagen to help create the Caswell Eidson Chair in Poultry Medicine.

I was fortunate to take a unique class in Avian Parasitology at the Poultry Science Department with the legendary coccidiosis experts Doctors Peter Long (formerly from the Animal Health Institute, Houghton, UK) and Larry McDougald. We had only one final exam, and I felt confident I had "aced" it. That was not the case. Upon getting my test back (written-essay questions) from Dr. Long, I saw several red ink marks through the pages (resulting in point subtractions) denoting spelling errors and "poor English grammar." I was dumbfounded, but I told myself that I was there to learn and to get over it. A few weeks later, I ran into Dr. Long, who kindly said, "Hey Greg, you did very well,

but keep working on your English. I am still working on it, and my beloved wife and daughters are always happy to help me.

Assistant Professor at UNAM

I returned to Mexico in the Summer of 1983. I joined the faculty of the DPAA at UNAM with the support of Doctors Benjamin Lucio (Department Head) and Armando Antillon (Dean of the Veterinary School). Returning to Mexico as an assistant professor at my alma mater was an honor and highly motivating. Working at UNAM allowed me to pay back my scholarship loan to CONACYT. I taught senior vet students a course on avian diseases and collaborated with Dr. Lucio in a similar class for graduate students. Soon after I joined the faculty, I assumed responsibilities as coordinator of the DPAA's laboratory diagnostic services. It was a hectic time filled with academic and diagnostic activities and continuous invitations to give presentations on disease prevention and control at other universities or meetings of regional poultry associations. There were many requests to write articles for various poultry industry trade magazines. Following reports of outbreaks of highly pathogenic avian influenza (HPAI) in the states of Pennsylvania, New Jersey, Maryland, and Virginia (1983 and 1984), Dr. Lucio and I wrote articles and spoke at meetings on avian influenza and its potential impact. We were concerned that this disease could be introduced by contact with migratory birds or by importing unregulated poultry products. We conveyed the urgent need to create awareness, establish monitoring programs, and prepare contingency plans. Unfortunately, HPAI caused by serotypes H5N2 and H7N3 was reported in 1994 and 2012 and became a persistent threat to the poultry industry.

Working with former professors, colleagues, graduate students, and vet student-trainees was enjoyable and rewarding. At the start of my work at the DPPA, I shared an office with Dr. Carlos Lopez-Coello (who specialized in metabolic diseases and poultry nutrition). Our working relationship developed into a life-long friendship and consulting jobs. As an assistant professor, I reviewed a few theses and remembered one (on a surgical procedure for dogs) due to its high quality and hand drawings. The author was a senior vet student named Guillermo Zavala, with whom I would cross paths again years later. I kept in touch with Dr. Villegas and shared my desire to advance my academic training as my loan to CONACYT was about to be paid back. One day he asked if I would be interested in pursuing a Ph.D. working with him on a state-funded project investigating IBDV strains in Georgia. Returning to PDRC was an exceptional and exciting opportunity as there was an alluring plan to move the DPAA to the state of Morelos (an hour's drive from UNAM's main Campus) and expand the laboratory into a National Poultry Research and Diagnostic Center. Doctors Lucio and Antillon supported my return to the U. of Georgia, and I hoped to return to Mexico upon completing my studies.

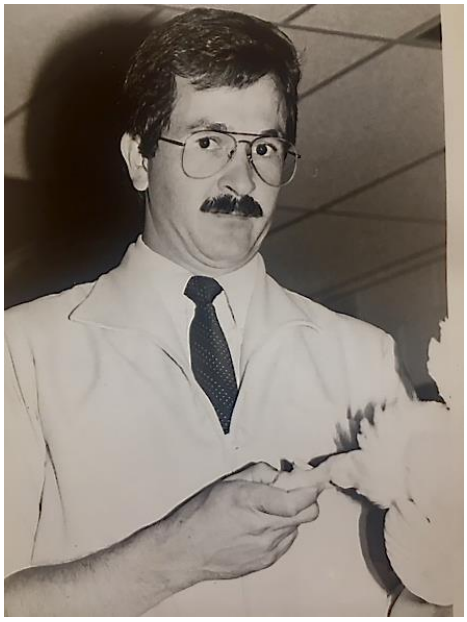
Doctor of Philosophy

Returning to graduate school (1985) was elating and arduous as the required courses and research work were more intense than those in the master's program. Fortunately, Dr.

Villegas and fellow graduate students were helpful and supportive during the most demanding times. Two back-to-back semesters of biochemistry with quizzes every Monday were an actual test of commitment and endurance. Soon enough, I readapted and started enjoying student life and working at PDRC again. Having rich Colombian coffee every morning at Dr. Villegas' lab and focusing on my research on IBD were stimulating and exciting.

My research project was on the isolation, pathogenicity, and characterization of IBDV strains antigenically different from the classic Serotype I virus capable of causing severe bursal atrophy and immunosuppression. We isolated two variant strains using sentinel birds placed at two broiler farms in Georgia, and these farms had a history of poor performance and increased respiratory disease and condemnations. Our studies demonstrated that these variants caused bursal atrophy and immunosuppression in the presence of significant levels of maternal immunity (induced by inactivated vaccines with classic strains), supporting previous findings by Dr. J. K. Rosenberger and S. S. Cloud using variant strains isolated in Delaware. However, our virus neutralization tests and bursal lesion scoring results demonstrated that an active immunity induced by an intermediate type of live vaccine strain could have a higher degree of cross-protection against antigenically different viruses. These results highlighted opportunities to improve prevention strategies through live vaccine protection studies in live birds rather than in vitro only. Our research project used traditional virology methods only. A few years later, Dr. Holly Sellers, also working with Dr. Villegas, conducted antigenic (ELISA testing using monoclonal antibodies) and molecular analysis of the VP2 region (RT-PCR amplification, sequencing, and phylogenetic analysis) to further characterize and confirm our IBDV isolates as variant strains. Our studies at Dr. Villegas' lab provided additional evidence of antigenic variation among pathogenic IBDV strains, presumably due to naturally occurring antigenic drifts and selective pressure.

My Ph.D. committee included Doctors Pedro Villegas, Phil Lukert, Max Brugh, Oscar Fletcher, and my former classmate John Glisson. I am indebted to all of them for their support, contributions, and valued suggestions for my dissertation and manuscripts for publication. I have great memories of being at Dr. Lukert's lab (at the College of Veterinary Medicine), where he showed me how to prepare an IBDV conjugate for immunofluorescence testing and embryonic bursal cell cultures in suspension. Although I took his class on animal virology, it did not compare to listening to him talk about various research issues, learning from his experience (he developed one of the first live attenuated IBD vaccines), and enjoying his great sense of humor while working at the lab. Also, I thank Dr. John Brown for his kind assistance with statistical analysis. All the work done during almost three years at Dr. Villegas' lab was possible because of the help of his technicians, Denise Pesti, Nancy Pritchard, Patrick Kane, Wilfrido Solano, and Allan Nix.



While writing my dissertation and manuscripts for the Journal of Avian Diseases, I had the honor of having helpful discussions with Dr. Max Brugh. In my preliminary exams, Dr. Brugh asked me to describe how I would design a health diagnostic laboratory for a modern poultry company and list the tests and instrumentation to be used to examine the health status of the flocks, evaluate responses to vaccination, and assess the effectiveness of cleaning and disinfection procedures. As it turned out, this question was a vision into the future and my responsibilities as a primary breeder veterinarian.

Broiler Primary Breeding

Before and after completing my Ph.D. program at UGA, Mexico was going through a nationwide financial crisis that led to spiraling inflation, the devaluation of the Mexican Peso, and severe stagnation of the economy. Consequently, scarce job prospects and the project's cancelation to expand and move the DPAA into a National Poultry Research and Diagnostic Center were a setback to my intention to return to UNAM. Luckily, thanks to recommendations from Dr. Villegas and other professors at PDRC, I was offered positions in the US-allied poultry industry. These involved technical support work and extensive traveling abroad. I hoped working in the poultry primary breeding industry for a few years would allow me to gain broad and international experience.

My first job at a broiler primary breeding company started in the Spring of 1988 at Indian River International in Nacogdoches, Texas. I became the first veterinarian employed full-time by the 50-year-old company founded by Mr. George Ellis in Ocean View, Delaware. As Director of Technical Services, I managed the health and biosecurity programs for all generations of the breeding program and the technical support team. One of my first projects was to design, build, and have a diagnostic laboratory operational one year after breaking ground. At the time, this company was part of the Lohmann LTZ group (Cuxhaven, Germany). Therefore, my one-week induction period was at a laying hen breeding company (Hy-Line International) owned by Lohmann. Dr. William Chase was my host and mentor in the poultry breeding world at Hy-Line's laboratory in Dallas Center, Iowa.

Dr. Egon Vielitz and me at a meeting in East Lansing, Michigan.

Soon after joining Indian River, I began learning about broiler breeder management and had a fantastic trainer, Mr. Kenneth C. Lewis. Mr. Lewis was one of the three best-known experts in broiler breeder management, along with Julius Summers of Arbor Acres and Paul Seurer of Hubbard Farms. I visited Lohmann and TAD Laboratories in Cuxhaven during my first year and met Dr. Egon Vielitz. Dr. Vielitz was a brilliant veterinarian and a supportive colleague throughout my career. During my first trip to Germany, I met Dr. Ullrich Lören, who hosted me at the laboratory of the broiler-producing company (Wiesenhof PHW, Visbek-Rechterfeld) belonging to the Wesjohan family, who also owned Lohmann LTZ, and eventually acquired Aviagen (through the EW Group). After visiting Germany, I traveled to Rome to give a presentation on IBD and variant strains in the US at the annual meeting of the European Poultry Study Group. There I met the legendary Dr. Tony Harris from Ross Breeder (Edinburgh, Scotland) and Dr. Ricardo Martinez-Aleson (Madrid, Spain).

I will always be grateful for the opportunity to work for Indian River and its President, Mr. Juergen Behles, who allowed me to get a great start and supported me through becoming a US resident. I traveled frequently and provided technical support on disease prevention and control to customers in the US, Latin America, Europe, and the Middle East. Living in Nacogdoches (Northeast Texas) was charming, and I quickly became a fan of the famed Texas-style BBQ. While my office and the diagnostic laboratory were under construction, I shared office space with Ana Maria Blalock, the Distribution Manager responsible for certifying and shipping broiler breeding stock to customers in the US and overseas. At first, Ana Maria was a bit unsure about the new vet, but after a brief dating period, we became engaged and married the following year in Lufkin, Texas. In 1990, we were blessed by the birth of our daughter Rachael Christina.

Celebrating Indian River's 50th anniversary with Ana Maria and Dr. Pedro Villegas in Nacogdoches, Texas.

One of the highlights of my time at Indian River was working with Dr. John Tierce, Vice President of the Genetics Department. He was a great colleague in the world of broiler breeding and helped me understand quantitative genetics. In those days, there were over a dozen broiler breeding companies in the US, and there was fierce competition to gain market share and stay profitable. I became fascinated after visiting pedigree flocks with Dr. Tierce, understanding the selection process and attributes (economically relevant traits) of specific pure lines, and seeing comparison tests of different line crosses. My interest evolved into a passion for this highly competitive industry after traveling to Brazil and encountering Indian River flocks and another broiler breeder line that, under ideal management conditions, performed better than the top breed in the US and exceeded the standards published in the management guides. Dr. Tierce also encouraged me to attend Philip Crosby's Quality Management School with him, which was a fantastic experience. This management seminar focused on creating and maintaining a quality culture for companies supplying products and services. One of the most important things I learned is best described in a quote from the writer and expert on leadership John C. Maxwell: "*If you want to lead, you need to grow. Good leaders are always good learners"*. From this point, I realized that having a robust education in poultry medicine had not prepared me to be a good manager or a team leader. Hence, this was the beginning of a continuous learning and self-development journey.

While at Indian River, I was fortunate to meet two young individuals who became successful poultry medicine professionals. The first one was Miss Holly Sellers, a student from the local college (Steven. F. Austin State University) who worked in the serology section at our laboratory. After she obtained her BS in Biology, she wanted to pursue further education in poultry microbiology and asked for my recommendation. She went to the U. of Georgia and obtained her MS and Ph.D. degrees working with Dr. Villegas at PDRC. Dr. Holly Sellers is now a Professor at PDRC and is an accomplished clinical and molecular virologist. The second one was a veterinarian from Mexico enrolled in an MS

program at Texas A&M (College Station, Texas) who came to visit me in Nacogdoches. Dr. Guillermo Zavala was the former senior vet student whose thesis I reviewed while working as an assistant professor at UNAM. He also wanted my recommendation to advance his education in a poultry medicine program. Dr. Zavala went to the U. of Georgia, where he worked with Dr. Villegas, earned MS, MAM, and Ph.D. degrees, became an assistant professor, and is now a renowned international poultry health consultant.

In the Fall of 1991, Dr. Charles L. Hofacre, my colleague, and long-time friend who had obtained his Ph.D. at PDRC two years before me, encouraged me to apply for a position in the technical support team at Ross Breeders in Elkmont, Alabama. This opportunity could not have come at a better time. The future of Indian River was uncertain with the arrival to the market of new high-yield breeder lines that outperformed Indian River and other conventional lines. I accepted the position, and Ana Maria and I established our residence in Athens, Alabama where we raised our daughters and live today. Almost two years after my family and I moved to North Alabama, Indian River ceased to operate. Lohmann LTZ kept the trade name Indian River, and eventually, it became another broiler breeder line sold by Aviagen.

Working at Ross Breeders with Dr. Hofacre (Vice president of Veterinary Services) in Elkmont and Doctors James C. McKay (Vice President of Biotechnology) and George McIlroy (Veterinarian Health Director) from the company's European team in Edinburgh, Scotland was an exceptional and enriching experience. Being employed by a rising primary broiler breeding company committed to producing breeding stock under the highest health and biosecurity standards was fulfilling and challenging.

Supporting the introduction of breeders with improved broiler traits required modifications to management practices and body weight standards. We frequently heard breeder managers and servicemen say, "This is how we have always done it, and your recommendations will increase my production cost." Promoting change was a grueling evolutionary process. Frequently we were troubleshooting health and performance issues in flocks raised under conditions that did not meet their needs and allow them to express their genetic potential. Gradually the broiler industry adopted management changes, field performance improved, and our commercial relationship with customers and company veterinarians developed into engaging partnerships. Unquestionably, the main driver was that new breeds produced broiler flocks with superior performance as the broiler industry faced a growing consumer demand for white and further processed meat products.

As a Staff Veterinarian, I traveled extensively in the US and Latin America providing technical customer support alongside a team of breeder and broiler management specialists. In this role, I had the opportunity to contribute to numerous presentations at company-sponsored seminars and industry meetings and the writing of technical bulletins on management and disease prevention. Internally, I supported our diagnostic laboratory staff, performed necropsy exams, and visited farms and hatcheries in Alabama and Tennessee at the request of managers from different sections of the breeding program.

In 1992, a year after joining Ross Breeders, two events were a great source of joy and pride; our daughter Sarah Elizabeth was born, and I became a Diplomate of the American College of Poultry Veterinarians (ACPV). Continuous field experiences, and Dr. Hofacre's support, inspired me to write and publish a review on managing stress in broiler breeders (1994) as one underestimated but common factor affecting flock health and performance. These experiences also made me realize that, as poultry veterinarians, we needed to engage and lead in promoting animal welfare and developing policies and practices for farms and hatcheries. I joined the animal welfare committee of the American Association of Avian Pathologists (AAAP), which I chaired between 1995 and 1997, and helped organize the first AAAP symposium on animal welfare. Years later, I participated in a National Chicken Council (NCC) committee that developed the first nationally recognized welfare guidelines for broilers and breeders.

Late in the Summer of 1995, Dr. Hofacre accepted a position with Bayer Corporation and moved to Watkinsville, GA. Hence, I had the opportunity to transfer from my technical services position to become the veterinarian responsible for the internal health programs and laboratories. From the start, Mrs. Lynette McBay (Laboratory Manager in Elkmont, AL) and Dr. Carolyn Miller (Laboratory Manager and later Pedigree Program Veterinarian, Crossville, TN) helped me to make the change and ensure the continuity of all programs. In the Fall of that year, Mr. Ian Panton, President of Ross Breeders (and subsequently CEO of Aviagen), appointed me Director of Veterinary Services and, three years later, Vice President of Veterinary Services. I will always appreciate Mr. Panton's trust and support in becoming the manager of the veterinary services department and a member of the company's executive team. During the same year, Ross Breeders moved its offices from the small town of Elkmont to the city of Huntsville, known for its high-tech communications, aerospace, and military technology industry. Shortly after taking my new role, we recruited Dr. Eric L. Jensen, who became a trusted team member and Grandparent Program Veterinarian for the following 15 years. Subsequent and successful additions to our Veterinary Services Department team included Doctors Phillip Eidson, Kate Hayes, and Kenneth Powell. I owe a debt of gratitude to Doctors Miller, Jensen, Eidson, Hayes, and Powell for their hard work and contributions to our veterinary programs and for ensuring compliance with internal and regulatory requirements for the sale and distribution of the company's breeding stock to customers in the US and many countries around the world.

Meeting with Doctors K. Powell, E. Jensen, C. Miller, P. Eidson and K. Hayes in Elkmont, AL.

In 1996 I completed the naturalization process to become a US citizen. Attaining dual citizenship was a feat that made me reflect and appreciate how fortunate I was and reaffirmed my commitment to participate and contribute to various professional, regulatory, and industry associations. Subsequently, a significant event for all of us at the company occurred in 1999 when Ross Breeders merged with Arbor Acres and created Aviagen. This merger was followed by the launching of new breeder lines into the market and our operations' continuous growth and expansion. It seems that we never had a dull moment during my last 16 years at Aviagen. Continuous improvements in farm and feed biosecurity, advancing health monitoring programs, compliance with increasingly demanding regulatory health requirements, the elimination of Salmonella spp., eradication of avian leukosis virus subgroup-J (ALV-J), chicken anemia and adenovirus (inclusion body hepatitis) control, and achieving certification as a compartment free of avian influenza were a few among various tasks that obliged the whole veterinary services team to keep learning, improving, and pursuing evolving goals and targets.

I was privileged to collaborate closely with National Poultry Improvement Program (NPIP), USDA, and State Governments colleagues. These collaborations were true partnerships between the primary breeding industry with professionals in federal and state agencies and poultry medicine experts from academia. I have immense gratitude for Mr. Andrew Rhorer, Doctors Denise Heard and Elena Behnke from the NPIP, and the State Veterinarians of Alabama (Dr. Tony Frazer), Tennessee (Charlie Hatcher), and Mississippi (Jim Watson), whose support was essential for our business. I was fortunate to participate in the establishment of collaborative research agreements with Doctors Aly

Fadly and Dick Witter at the Avian Diseases and Oncology Laboratory (ADOL) in East Lansing, Michigan, and Dr. Pedro Villegas at PDRC, Athens, Georgia. These collaborative research agreements were instrumental in developing and improving our diagnostic procedures and control strategies against tumoral diseases and avian adenovirus, respectively. Throughout my years at Aviagen, and mainly when dealing with research projects and reviewing policies and disease prevention strategies, Doctor James C. McKay (Vice President of Biotechnology, Aviagen Ltd. Edinburgh, Scotland), who coordinated the company's global veterinary teams, was a great mentor, steadfast sounding board, and thoughtful supporter of our veterinary services team.

Celebrating with Dr. Eric Jensen the certification of Aviagen as an AI Clean Compartment

At Aviagen, I had the pleasure of collaborating and learning from energetic coworkers and outstanding professionals. Dr. Bryan Fancher (Vice President of Global Technical Services and Poultry Nutrition Specialist) spearheaded the development of several innovations and redefined customer technical support by developing and introducing data analysis tools to statistically assess breeder and broiler performance under different management and nutritional regimens. Dr. Derek Emmerson (Vice President of Research and Development and Genetics Specialist) helped me appreciate how the selection program is based on a balanced approach incorporating gradually evolving quantitative and biological traits to align with market and consumer requirements. I frequently enjoyed conversations with him on how we, the veterinary team, could support this selection process by raising pure lines under ideal and high biosecurity facilities and comparing the performance of these birds with that of their siblings grown under average built-up litter house environments. His untimely passing left a great void, and many of us miss him greatly. Finally, I must acknowledge my working relationship with Dr. Nick Dorko (Global Director of Veterinary Technical Support), who moved to Huntsville, Alabama, following the merger with Arbor Acres Farms. Nick is one of the most knowledgeable globe-trotting veterinarians I have ever known. My team and I benefited greatly from his wealth of experience that included clinical observations gathered by him

and his team of veterinarians traveling in the US and around the world, his practical and comprehensive presentations on disease control schemes and biosecurity practices, and especially his suggestions to improve our internal breeding program's disease prevention strategies.

Since my days in vet school, I dreamed about becoming an active member of the American Association of Avian Pathologists (AAAP). Throughout my academic training and professional career, I benefited greatly from the association's journal, books, manuals, and, most recently, online webinars. Contributing to the journal with a few articles and two editions of the Practical Guide for Managing Risk in Poultry Production was gratifying. Attending the annual meeting for over 30 years was always a priority on my agenda as it was the best continuous education and professional networking opportunity. I believed that active participation in the association's committees was a responsibility and another essential learning opportunity. Over the years, I served on several committees, but the one I remember with the most satisfaction was the Scientific Program Committee. I worked with Dr. John Glisson for three years and then three more as Chair with Dr. Richard Chin (2006 - 2009). As Chair, I enjoyed working with the AVMA's Convention and Planning Committee members. Despite some challenges, I had a great experience and developed great professional relationships with other non-poultry veterinarians and all the AVMA staff. It was great working with Mrs. Janece Bevans-Kerr, who, along with Mr. Bob Bevans-Kerr, took over the management of AAAP, bringing much-needed enhancements to the organization. I am very proud for presenting a proposal to the AAAP's Board of Directors (BOD) to create a new award to recognize the best field or diagnostic case report during the scientific program of the annual meeting. The BOD accepted it and asked me and Dr. Darrell Kapczynski (Chair of the Awards Committee) to develop the requirements for the award. I will be forever grateful to the AAAP and member colleagues for their support and granting me with the Special Service (2012) and Lasher-Bottorff (2018) awards.

AAAP in Washington, DC March 2009 to advocate for poultry Issues

Doctors Robert Owen, Nick Dorko, and I were cofounders and active participants in the Association of Primary Breeder Veterinarians. As we faced the emergence of ALV-J, we produced a white paper describing the disease (myeloid leukosis), ongoing efforts to detect and eliminate the virus in primary breeding stock, and management strategies to reduce its clinical impact at the breeder level. After revision and editing by Doctors James McKay and Aly Fadly, this paper was distributed worldwide and translated into over a dozen languages. Fortunately, ALV-J has been eradicated from the major broiler breeding programs in the US and Europe thanks to the expert support from our colleagues at the Animal Health Institute (Compton, England) and ADOL (East Lansing, Michigan). Other notable professional activities include serving on the Board of Directors of the US Animal Health Association (USAHA) and participating in the Committee for Transmissible Diseases in Poultry, the Board of Governors of the ACPV, General Conference Committee of the NPIP, and the US Poultry and Egg Association's (USPEA)) Foundation Research Advisory Committee. This committee, chaired initially by Doctor Charles Beard and later by Dr. John Glisson, was a rewarding opportunity to learn, review, and comment on proposals aiming to help the poultry industry solve various challenges. I appreciate serving on this committee (2005 -2013) and being recognized subsequently by USPEA's with its Lamplighter Award (2015).

Consultant on Poultry Health

In the Fall of 2015, after 27 years of service in the primary broiler industry, and thanks to the support of my wife and daughters, I decided to enter a semiretirement phase working as a consultant on a part-time basis. I traveled to countries in the Far East and Latin America, assisting broiler companies to improve their biosecurity, monitoring programs, and diagnostic capabilities. The rise of Avian Influenza as a global threat created opportunities for me to conduct biosecurity audits and risk assessments, write technical bulletins, and make presentations on the prevention and control of this disease. In addition, I worked for almost three years as a writer, editor, and technical director for a trade magazine based in Barcelona. During the coronavirus pandemic, all travel plans ceased; however, I continued writing articles for online trade publications, participated in expert panel discussions, and provided technical assistance to two marketing agencies. Through videoconferencing, I collaborated with colleagues at Aviagen and vaccine manufacturing companies in educational webinars for customers, mainly in Latin America. I enjoyed these activities which kept me doing literature searches and attending continuous education meetings online. By the start of 2023, I entered full retirement, but to this day, I continue to be an enthusiastic reader of poultry medicine publications, and trade industry magazines and newsletters.

Final Acknowledgements

I sincerely thank Doctors Gabriel Senties and Karel A. (Ton) Schat of the AAAP's History Committee for their persistent encouragement to write this biography.

The mentorship and friendship of Dr. Pedro Villegas helped me to find a professional path that became my future, and he has been a constant example of dedication and high ethical standards.

My wife, Ana Maria, has been my loving and supportive partner for over 30 years. Our daughters, Rachael Christina, and Sarah Elizabeth have been our pride and joy. They have been very understanding of my professional endeavors.

Becoming a veterinarian and poultry medicine specialist has been inspiring and rewarding. This journey was possible thanks to the support of educational institutions, professors, professional organizations, and many colleagues who helped me along the way. This honorable profession has allowed me to fulfill my dreams and find happiness, knowing that I have done my best to protect poultry health and welfare and contribute to this mission's continuous advancement.

Biography solicited by the Committee on the History of Avian Medicine, American Association of Avian Pathologists.

Additional biographical materials may be available from the AAAP Historical Archives located at Iowa State University. Contact information is as follows:

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