

**CURRICULUM VITAE**  
**Eduardo Arturo Fano Gonzalez**

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**PERSONAL INFORMATION**

**Date of Birth**            July 14<sup>th</sup> 1973  
**Place of Birth**            México City, México.  
**Citizenship**            Mexican  
**Sex**                        Male

**EDUCATION**

**1992-1997**            DVM            College of Veterinary Medicine  
   Instituto Tecnológico de Sonora  
   Cd. Obregón, Sonora, México.  
   (Graduated with honors)  
   Thesis title: Macroscopic and Microscopic characterization  
   of lesions on condemned livers in swine slaughterhouses  
   located in Sonora, Mexico.

**1998-2000**            MSc            College of Veterinary Medicine  
   Universidad Nacional Autónoma de México  
   México, D.F.  
   (Graduated with honors)  
   Thesis title: Control of PRRSV by gilt acclimatization and  
   partial nursery and finishing depopulation.

**2003- 2007**            PhD            College of Veterinary Medicine  
   University of Minnesota  
   St. Paul, MN, USA.  
   Research topic: Mycoplasma hyopneumoniae epidemiology:  
   Transmission, Persistence and Impact of the prevalence at  
   weaning in the subsequent group's Mycoplasma status.  
   Advisors: Carlos Pijoan and Scott Dee.  
   Area: Population Medicine and infectious diseases

## EMPLOYMENT HISTORY

**1997** College of Veterinary Medicine, Instituto Tecnológico de Sonora.  
Professor: Histology.

In this employment I developed academic and teaching skills.

**1998-1999** Asesoría Técnica Especializada en Porcicultura (ATEP).

- I worked as a consultant in several farms located in central México.
- Development of disease control programs. Specifically, *Mycoplasma hyopneumoniae*, *Actinobacillus pleuropneumoniae*, *Salmonella choleraesuis*,
- *Haemophilus parasuis* and PRRSV
- Design of clinical and field trials.
- Diagnoses interpretation
- Laboratory experience: Histopathology, PRRSV ELISA and PRRSV IFA.

**1999-2002** SPR AP Soles de RL, Swine Production Department. Sonora, México.  
Research and Development Coordinator

- Design and implementation of PRRSV control and elimination programs
  - Gilt acclimatization protocols
  - Nursery and finishing depopulation
- Design and implementation of programs focused to control the clinical effect of PRDC
  - *Mycoplasma hyopneumoniae* vaccination and use of feed medication
  - *Actinobacillus pleuropneumoniae* vaccination and use of feed medication
  - *Salmonella choleraesuis* vaccination and use of feed medication
  - Swine influenza virus
  - Understanding of epidemiological patterns.
- Design and implementation of programs focused in control intestinal diseases
  - Ileitis vaccination and use of feed medication
- Design and development of clinical and field trials.
- Design of disease monitoring programs.
  - Histopathology
  - Serology
  - Molecular biology
  - Slaughter checks
- Responsible of the Biosecurity programs.

- 2000-2001** College of Veterinary Medicine. Instituto Tecnológico de Sonora.  
Professor: Histology, Epidemiology and Swine Diseases
- In this period I improved substantially my knowledge in Epidemiology and Swine diseases.
- 2002- 2008** SPR AP Soles de RL, Swine Production Department. Sonora, México.  
Consultant (Health programs)
- Design of disease control and elimination protocols
  - Designs of disease monitoring programs
  - Clinical and field trials
  - Biosecurity
- 2003- 2007** Veterinary Population Medicine, College of Veterinary Medicine, University Of Minnesota.  
Research Assistant.
- Design of experiments
  - Design of filed trials
  - Grant writing
  - Publication in scientific journals
  - Laboratory experience: Conventional and real time PCR. Sequencing.
- 2007- 2008** Swine Health and Production Department. College of Veterinary Medicine. Universidad Nacional Autonoma de Mexico (UNAM).  
Full time professor (research and teaching): Applied Epidemiology in Swine Farms, Swine Diseases and Swine Production.
- 2008- 2012** Swine Health and Production Department. College of Veterinary Medicine. Universidad Nacional Autónoma de México (UNAM).  
Part Time Professor: Applied Epidemiology in Swine Farms
- 2008-2011** PIC LatAm. Director of Technical Service
- Head of the technical service team (Production, Meet Quality, Genetics and Health)
- 2011-2012** PIC LatAm. Health Assurance and Health Services.
- Leading the Health Assurance program for PIC LatAm

- Own multiplication
  - Associated Multiplication
  - Liquid Genetics (Boar Studs)
- Health Services to Key Accounts of the region. 30 Accounts.
    - Mexico
    - Guatemala
    - Colombia
    - Venezuela
    - Peru
    - Ecuador
    - Brazil
    - Chile
    - Argentina

**2012 – 2015** Boehringer Ingelheim Vetmedica Co, Technical Manager Swine Americas

- Direct interaction with Technical Teams of the Americas
- Health support to Key Accounts
- Mycoplasma Team, BI USA
- PRRSolutions Team, BI USA

**2016 – Current** Boehringer Ingelheim Animal Health, US, Technical Manager (PCV2 and Mycoplasmas)

**AWARDS AND HONORS:**

- 2000 Mexican Association of Swine Veterinarians (AMVEC), “*Sus scrofa*” Best research paper, “Evaluación serologica de tipo longitudinal con respecto a PRRS y *Mycoplasma hyopneumoniae* con fines de interpretación epidemiológica”.
- 2001 Mexican Association of Swine Veterinarians (AMVEC), “*Sus scrofa*” Best research paper, “Evaluación clínica y productiva de 3 diferentes biológicos en contra de *Mycoplasma hyopneumoniae*”.
- 2005 “Veterinary Medicine Graduate Fellowship Competition” College of Veterinary Medicine, University of Minnesota.

## PUBLICATIONS

### Peer Reviewed (Scientific publications)

1. Anderson A, Sponheim A, **Fano E**, Dalquist L, Leuwerke, Pieters M. Field-based protocol for successful *Mycoplasma hyopneumoniae* isolation. Submitted to JSHAP, 2017.
2. Roos LR, **Fano E**, Homwong N, Payne B and Pieters M. A model to investigate the optimal seeder-to-naïve ratio for successful natural *Mycoplasma hyopneumoniae* gilt exposure prior to entering the breeding herd. *Veterinary Microbiology* 2016; 184 (2016) 51-58.
3. Pieters M and **Fano E**. *Mycoplasma hyopneumoniae* management in gilts. *Veterinary Record* 2016; 178:122-123.
4. **Fano E**, Pijoan C, Dee S, Deen J. Longitudinal assessment of two *Mycoplasma hyopneumoniae* enzyme-linked immunosorbent assays in challenged and contact-exposed pigs. *J Vet Diagn Invest.* 2012 Mar;24(2):383-7.
5. Pieters M, **Fano E**, Pijoan C, Dee S. An experimental model to evaluate *Mycoplasma hyopneumoniae* transmission from asymptomatic carriers to unvaccinated and vaccinated sentinel pigs. *Can J Vet Res.* 2010; 74(2): 157–160.
6. Pieters M, Pijoan C, **Fano E**, Dee S. An assessment of the duration of *Mycoplasma hyopneumoniae* infection in an experimentally infected population of pigs. *Vet Microbiol.* 2009; 2;134(3-4):261-6.
7. **Fano E**, Pijoan C, Dee S, Deen J. Effect of *Mycoplasma hyopneumoniae* prevalence at weaning on disease severity in growing pigs. *Can J Vet Res* 2007; 71(3):195-200.
8. **Fano E**, Pijoan C, Dee S. PRRSV infection in a continuous flow population with a *Mycoplasma hyopneumoniae* dual infection. *Vet Rec* 2007; 161(15):515-520.
9. Cho JG, Dee SA, Deen J, Trincado C. **Fano E**, Murtaugh MP, Collins JE and Joo HS. An evaluation of different variables on the shedding of porcine reproductive and respiratory syndrome virus in aerosols. *Can J Vet Res* (Accepted for publication)
10. Cho JG, Dee SA, Deen J, Guedes A, Trincado C, **Fano E**, et al. Evaluation of the effects of animal age, concurrent bacterial infection, and pathogenicity of porcine reproductive and respiratory syndrome virus on virus concentration in pigs. *Am J Vet Res.* 2006; 67(3):489-93.
11. **Fano E**, Pijoan C and Dee SA. Evaluation of aerosol transmission of a mixed infection of *Mycoplasma hyopneumoniae* and porcine reproductive and respiratory virus *Vet Rec* 2005;

157,105-108.

12. **Fano E**, Pijoan C, Dee S. Dynamics and persistence of *Mycoplasma hyopneumoniae* infection in pigs. *Can J Vet Res* 2005; 69:223-228.
13. Schurrer JA, Dee SA, Moon RD, Rossow KD, Mahlum C, Mondaca E, Otake S, **Fano E**, Collins JE, and Pijoan C. Spatial dispersal of porcine reproductive and respiratory syndrome virus-contaminated flies following contact with experimentally infected pigs. *Am J Vet Res* 2004; 65(9):1284-92.
14. **Fano E**, Olea L, Pijoan C. Eradication of Reproductive and Respiratory Syndrome by serum inoculation of naïve gilts. *Can J Vet Res* 2005, 69:71-74.
15. Dee SA, Boorman J, Moon RD, **Fano E**, Trincado C, and Pijoan C. Transmission of porcine reproductive and respiratory syndrome virus under field conditions during a putative increase in the fly population. *Journal of Swine Health and Production* 2004. 12:242-245.

#### **Abstracts in Proceedings**

- **Fano E.**, Schaefer, N., Schmaling, E., Edler, R. Comparison of efficacy between two PCV2 vaccination protocols under PCV2d field exposure. International Pig Veterinary Society Congress. Dublin, Ireland. June 2016.
- **Fano, E.**, Cline, G. *Mycoplasma hyopneumoniae* microbial load and histological lesion reduction in piglets vaccinated with MycoFLEX®. American Association of Swine Veterinarians Annual Meeting. Denver, Colorado. March 2017.
- Brown, S., **Fano, E.**, Schaefer, N., Wedell, K., Pieters, M. *Mycoplasma hyopneumoniae* surveillance – a production system approach for health management decision making. Poster presentation. International Pig Veterinary Society Congress. Dublin, Ireland. June 2016.
- Dalquist, L., Sponheim, A., **Fano, E.**, Leuwerke, B., Pieters, M. Guidelines for sample selection from replacement gilts and growing pigs for successful *Mycoplasma hyopneumoniae* culture and isolation. Poster presentation. International Pig Veterinary Society Congress. Dublin, Ireland. June 2016.

- Dalquist, L., Sponheim, A., **Fano, E.**, Pieters, M. Field application of *Mycoplasma hyopneumoniae* molecular characterization and analysis tools. Poster presentation. International Pig Veterinary Society Congress. Dublin, Ireland. June 2016.
- Pieters, M., **Fano, E.** Proposed management for *Mycoplasma hyopneumoniae* gilt acclimation, a view point. Oral presentation. International Pig Veterinary Society Congress. Dublin, Ireland. June 2016.
- Roos, L., **Fano, E.**, Homwong, N., Payne, B., Pieters, M. *Mycoplasma hyopneumoniae* gilt acclimation: investigating the optimal seeder-to-naïve ratio for successful natural exposure. Oral presentation. International Pig Veterinary Society Congress. Dublin, Ireland. June 2016.
- Roos, L., Homwong, N., **Fano, E.**, Pieters, M. Diagnostic sensitivity of laryngeal swab samples for early *Mycoplasma hyopneumoniae* detection *in vivo*. Poster presentation. International Pig Veterinary Society Congress. Dublin, Ireland. June 2016.
- Sponheim, A., **Fano, E.**, Polson, D., Doolittle, K., Pieters, M. Influence of pooling on artificial laryngeal swab sample PCR results in low *Mycoplasma hyopneumoniae* prevalence scenarios. Poster presentation. International Pig Veterinary Society Congress. Dublin, Ireland. June 2016.
- Sponheim, A., Fitzgerald, C., **Fano, E.**, Polson, D., Pieters, M. Use of stochastic modeling to determine number of laryngeal swab sample pools and collections for detection of low *Mycoplasma hyopneumoniae* prevalence. Poster presentation. International Pig Veterinary Society Congress. Dublin, Ireland. June 2016.
- Pieters, M., **Fano, E.** Focus on reproductive herd management for *Mycoplasma hyopneumoniae* disease control in growing pigs. Poster presentation. Congress of the International Organization for Mycoplasma. Brisbane, Australia. July 2016.
- Fitzgerald, C., Sponheim, A., **Fano, E.**, Polson, D., Pieters, M. Stochastic modeling to determine the number of laryngeal swab sample pools and sample collections needed for low *Mycoplasma hyopneumoniae* group prevalences. American Association of Swine Veterinarians Annual Meeting. New Orleans, Louisiana. March 2016.

- Sponheim, A., **Fano, E.**, Polson, D., Doolittle, Pieters, M. Influence of pooling on *Mycoplasma hyopneumoniae* Polymerase Chain Reaction diagnostic assay results in expected low prevalence scenarios. Oral presentation. Allen D. Lemman Swine Conference. St. Paul, MN. USA. September 2015.
- Sponheim, A., **Fano, E.**, Polson, D., Doolittle, Pieters, M. Influence of pooling on *Mycoplasma hyopneumoniae* Polymerase Chain Reaction diagnostic assay results in expected low prevalence scenarios. Oral presentation. Allen D. Lemman Swine Conference. St. Paul, MN. USA. September 2015.
- **Fano, E.**, Payne, B. *Mycoplasma hyopneumoniae* gilt acclimation and sow herd stability: Essentials to the systematic control approach. American Association of Swine Veterinarians Annual Meeting. Orlando, Florida. March 2015.
- **Fano E**, Pijoan C, Deen J, Dee S. Prevalence of *Mycoplasma hyopneumoniae* in piglets at weaning as a predictor of the severity of the disease in growing pigs. Proceedings of the 19<sup>th</sup> IPVS congress, Copenhagen, Denmark, 2006. P 95 Volume 1 (Oral presentation)
- **Fano E**, Pijoan C, Dee S. Torremorell M. Assessment of the effect of sow parity in the prevalence of *Mycoplasma hyopneumoniae* in piglets at weaning. Proceedings of the 19<sup>th</sup> IPVS congress, Copenhagen, Denmark, 2006. P 96 Volume 1 (Oral presentation)
- **Fano E**, Pijoan C, Dee S. Assessing the *Mycoplasma hyopneumoniae* infection pattern in a sow herd following an increase in the replacement rate. Proceedings of the 19<sup>th</sup> IPVS congress, Copenhagen, Denmark, 2006. P 131 Volume 1 (Oral presentation)
- **Fano E**, Pijoan C, Dee S. Differences on the *Mycoplasma hyopneumoniae* seroepidemiologic pattern and growth performance in progeny from young and multiparous sows. Proceedings of the 19<sup>th</sup> IPVS congress, Copenhagen, Denmark, 2006. P 211 Volume 2 (Poster presentation)
- Pieters M, **Fano E**, Dee S, Pijoan C. Transmission of *Mycoplasma hyopneumoniae* to vaccinated and unvaccinated replacement gilts from persistently infected pigs. Proceedings of the 19<sup>th</sup> IPVS congress, Copenhagen, Denmark, 2006. P 102 Volume 1 (Oral presentation)
- Pijoan C, **Fano E**. Effect of an immune modulator on pig performance and vaccination against *Mycoplasma hyopneumoniae*. Proceedings of the 19<sup>th</sup> IPVS congress,



Copenhagen, Denmark, 2006. P 232 Volume 2 (Poster presentation)

- Rovira A, Pijoan C, Trevizo R, **Fano E**, Dee S. Successful PRRSV eradication by herd closure after failure of PRRSV control by serum inoculation. Proceedings of the 19<sup>th</sup> IPVS congress, Copenhagen, Denmark, 2006. P 396 Volume 2 (Poster presentation)
- **Fano E**, Pijoan C, Dee S. Prevalence of *Mycoplasma hyopneumoniae* in piglets at weaning as a predictor of the severity of the disease in growing pigs. The 37<sup>th</sup> Annual meeting of the AASV, Kansas City, USA, March 2006. P 441
- **Fano E**, Pijoan C, Dee S. Assessment of the effect of sow parity in the prevalence of *Mycoplasma hyopneumoniae* in piglets at weaning. Proceedings of the 85<sup>th</sup> Conference of Research Workers in Animal Disease, Chicago, USA, November 2004, Abstr #188.
- **Fano E**, Pijoan C, Dee S. PRRSV persistence in both directly challenged and contact-control pigs. Proceedings of the 85<sup>th</sup> Conference of Research Workers in Animal Disease, Chicago, November 2004, Abstr #182.
- **Fano E**, Pijoan C, Dee S. A longitudinal assessment of *Mycoplasma hyopneumoniae* serology, comparing three different infection routes and two ELISA tests. Proceedings of the 18<sup>th</sup> IPVS Congress, Hamburg, Germany June, 2004.
- **Fano E**, Pijoan C, Dee S. Evaluation of a nested-PCR technique from nasal samples to identify *Mycoplasma hyopneumoniae* in live animals. Proceedings of the 18<sup>th</sup> IPVS Congress, Hamburg, Germany June, 2004.
- **Fano E**, Pijoan C, Dee S. Aerosol transmission of a mixed infection of *Mycoplasma hyopneumoniae* and PRRS virus under field conditions. Proceedings of the 18<sup>th</sup> IPVS Congress, Hamburg, Germany June, 2004.
- **Fano E**, Pijoan C, Dee S. Assessing the duration of *Mycoplasma hypneumoniae* infection in gilts. Proceedings of the 18<sup>th</sup> IPVS Congress, Hamburg, Germany June, 2004.
- **Fano E**, Pijoan C, Dee S. PRRSV persistence in both directly challenged and contact-control pigs. Proceedings of the 18<sup>th</sup> IPVS Congress, Hamburg, Germany June, 2004.
- **Fano E**, Pijoan C, Dee SA. Evaluation of aerosol transmission of *Mycoplasma*

*hyopnuemoniae* and PRRSV (mixed infections) under field conditions. Proceedings of the 84<sup>th</sup> Conference of Research Workers in Animal Disease, Chicago, November 2003, Abstr #34.

- **Fano E**, Pijoan C, Dee SA. Evaluation of aerosol transmission of *Mycoplasma hyopnuemoniae* and PRRSV (mixed infections) under field conditions. Proceedings of the 84<sup>th</sup> Conference of Research Workers in Animal Disease, Chicago, November 2003, Abstr #34.
- Pijoan C, **Fano E**, Angulo J, Olea L, Jonson B, Jacobson L. Comparison of temperatura variations and effects on reproduction in tunnel ventilatedvsnatural ventilated gestation barns. Proceedings of the Allen D Lemam Conference, Minnesota, USA, September 2003.
- Doporto JM, **Fano E**. Evaluation of a PRRS diagnosis and control program at a three site pig farm in Mexico. The 16<sup>th</sup> International Pig Veterinary Society Congress, Melbourne, Australia. 2000.
- **Fano EA**, Doporto JM, Trujillo ME, Mendoza R, Correón R. Identificación de diferencias en los patrones de seroprevalencia con respecto a PRRS con fines de vigilancia epidemiológica en un sistema de producción. XXXV Congreso Nacional AMVEC, Acapulco, Guerrero, México. Julio 2000. P 67.
- **Fano-Gonzalez EA**. Evaluación serologica de tipo longitudinal con respecto a PRRS y *Mycoplasma hyopneumoniae* con fines de interpretación epidemiológica. XXXV Congreso Nacional AMVEC, Acapulco, Guerrero, México. Julio 2000. P 68.
- **Fano EA**. Study of PRRS diagnose integration and control. PRRS and Aujeszky's disease Proceedings, Ploufragan, France, June 1999.
- **Fano EA**, Doporto JM, Trujillo ME, Mendoza R, Carreon R. Estudio sobre integración de diagnostico de diagnostico y control del síndrome reproductivo y respiratorio del cerdo (PRRS). XXXIV Congreso Nacional AMVEC, Mérida, Yucatán, México. Julio 1999. P 185.
- **Fano EA**, Doporto JM, Trujillo ME. Monitoreo serologico y clinico referente a PRRS después de un proceso de despoblación en un sitio 3. XXXIV Congreso Nacional AMVEC, Mérida, Yucatán, México. Julio 1999. P 187.
- **Fano EA**. Doporto JM, Trujillo ME. Evaluación serologica referente a PRRS en hembras de reemplazo en el área de cuarentenas. XXXIV Congreso Nacional AMVEC, Mérida,

Yucatán, México. Julio 1999. P 189.

- **Fano-González EA**, Molina R, Fano EA. Caracterización de lesiones en hígados de cerdos decomisados en un rastro TIF del sur de sonora. XXXII Congreso Nacional AMVEC, Ixtapa-Zihuatanejo, Guerrero, México. Agosto 1997. P 151.

## INVITED PRESENTATIONS

**Fano E.** Evaluating the dynamics of *M. hyopneumoniae* in gilt acclimation – the start of the Infection Chain . Leman Conference, St. Paul, MN, USA, September 2014.

**Fano E.** Revisión de las estrategias globales para el control de PRRS a nivel granja y a nivel región. AMECAJ, Tepatitlan, Jalisco, México, Febrero 2012.

**Fano E.** *Mycoplasma hyopneumoniae*: Impacto y control. XX congreso dial del porcicultor, Navojoa, Sonora, México, Noviembre 2011.

**Fano E.** Control de afecciones respiratorias, su impacto en el costo de producción. Congreso G.I.T.E.P, Rosario, Argentina, Noviembre 2011.

**Fano E.** Ciencia, Práctica y Desarrollo, Conferencia “Mario Gomez”. Congreso AMEC Nacional, Acapulco, Guerrero, México, Julio 2010.

**Fano E.** Nuevos retos y tendencias en el control de enfermedades respiratorias del cerdo (Platica Magistral). Congreso AMVEC Nacional, Morelia, Michoacán, México, Julio 2008.

**Fano E.** Control del Complejo Respiratorio: La nueva tendencia. Jornadas Tecnica A.V.P.A (Asociacion Veterinaria de Porcinos de Aragon), Zaragoza, España, Abril 2008.

**Fano E.** Dinámica de Infección de *Mycoplasma hyopneumoniae*: Bases de los programas de control. Expoaviga, Memorial Carles Pijoan, Barcelona, España, Abril 2008.

**Fano E.** Nuevos retos y tendencias en el control de enfermedades respiratorias del cerdo. Congreso AMVECAJ, Tepatitlan, Jalisco, México, Febrero 2008.

**Fano E.** New information on *Mycoplasma hyopneumoniae* epidemiology. Leman Conference, St. Paul, MN, USA, September 2007.

**Fano E.** Inmunidad de Hato: *Mycoplasma hyopneumoniae*, *Actinobacillus pleuropneumoniae* y virus de la influenza porcina. “Platica Magistral” Congreso nacional AMVEC, Queretaro,

Queretaro, Julio 2007.

**Fano E.** Dinámica de infección de *Mycoplasma hyopneumoniae*. AgroExpo, Bogotá, Colombia, Julio 2007.

**Fano E.** Experiencias positivas en el uso de inóculos: El caso del manejo de suero en los programas de control de PRRS. Congreso nacional AMVEC, Ixtapa, Guerrero, Agosto 2006.

**Fano E, Pijoan C.** Epidemiología de *Mycoplasma hyopneumoniae*: Un punto de vista diferente. Congreso nacional AMVEC, Ixtapa, Guerrero, Agosto 2006.

**Fano E.** “Estrategias alternativas de inmunización: Ciencia y Empirismo”. VII Reunión Anual en Producción Porcina, Cd. Obregón, Sonora, México, Mayo 2006.

**Fano E. Pijoan C.** “Epidemiología de *Mycoplasma hyopneumoniae*, nuevos conceptos” XIV congreso dial del porcicultor, Navojoa, Sonora, México, Diciembre 2005.

**Fano E. Pijoan C, Dee S.** *Mycoplasma hyopneumoniae* prevalence at weaning as a predictor of the group’s subsequent *Mycoplasma* status. Allen D. Leman Swine Conference, St. Paul, MN, USA, September 2005.

**Fano E, Pijoan C.** “Actualidades en la epidemiología de *Mycoplasma hyopneumoniae*” Congreso nacional AMVEC, León, Guanajuato, Julio 2005.

**Fano E, Pijoan C, Dee S.** “Interacción entre el virus del PRRS y *Mycoplasma hyopneumoniae*”. Congreso nacional AMVEC, Mazatlán, México. 2004.

**Fano E, Pijoan C.** “Conocimientos epidemiológicos de *Mycoplasma hyopneumoniae* y su aplicación en el control y erradicación”. V Reunión anual de Producción Porcina, Cd. Obregón, Sonora, México, Mayo 2004.

## LANGUAGES SPOKEN

- Spanish Native
- English Fluent