



CENTRO DE DOCUMENTACIÓN Biblioteca

INFORMATIVO CEDOC

No. 1 – Enero 2007

En el presente número nos complace anunciar que a partir de Enero de 2007 haremos la divulgación quincenal del Informativo CEDOC dando continuidad a nuestro servicio de diseminación de información donde será posible encontrar artículos de interés publicados en la Internet sobre Salud Pública Veterinaria y temas de interés general, que podrán ser obtenidos a texto completo mediante un mensaje de solicitud a nuestro Centro de Documentación (CEDOC).

CEDOC	
Misión	Objetivo
<p>Mantener informados a los profesionales del Centro Panamericano de Fiebre Aftosa – OPS/OMS (PANAFTOSA-OPS/OMS) como proceso de educación continuada en Salud Pública Veterinaria a través del suministro de información técnico-científica.</p>	<p>Ofrecer subsidios bibliográficos técnico-científicos, suministrando información a los usuarios de PANAFTOSA-OPS/OMS en salud pública veterinaria, incluida las zoonosis, fiebre aftosa, enfermedades vesiculares y la inocuidad de alimentos.</p>



**Organización
Panamericana
de la Salud**

Oficina Regional de la
Organización Mundial de la Salud

**CENTRO PANAMERICANO DE FIEBRE AFTOSA
Unidad de Salud Pública Veterinaria – OPS/OMS**

Temas de interés general



El informe pone de relieve los principales acontecimientos de cooperación técnica que han tenido lugar en este período, especialmente los avances logrados en la reducción de las brechas de salud, en favor de las poblaciones menos favorecidas; todo dentro del marco del Plan Estratégico de la Oficina Sanitaria Panamericana para el período 2003–2007, aprobado por los Cuerpos Directivos de la Institución.

http://www.paho.org/Director/AR_2006/default.htm

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Desarrollo Rural

Mundo agrario Revista de estudios rurales
ISSN 1515-5994

Lecturas para agricultores: Herramientas intelectuales y representaciones de la agricultura familiar en Misiones (Arg.)

Schiavoni OMG

Mundo Agr. 2006; 6 (12)

El artículo describe el trabajo simbólico llevado a cabo por las agencias de desarrollo rural y las organizaciones agrarias en la provincia de Misiones en la década de 1990. Se consideran las publicaciones destinadas a los pequeños productores y las formas de apropiación de los textos a partir de conceptos de la historia cultural. Los impresos analizados ponen en juego distintas representaciones de la agricultura familiar, especialmente las nuevas categorías agrarias que se difunden en la provincia (campesinos, mujeres rurales, agricultores sin tierra). La producción de los textos se organiza de acuerdo a las dimensiones que estructuran el campo del desarrollo rural: saberes nativos versus transferencia tecnológica; integración agroindustrial versus autonomía campesina; agricultura industrial versus agroecología, etc.

http://www.scielo.org.ar/scielo.php?script=sci_arttext&pid=S1515-59942006000200003&lng=pt&nrm=iso&tlng=es

Encefalopatías Espongiformes Transmisibles



The transmissible spongiform encephalopathies: emerging and declining epidemics

Manson JC, Cancellotti E, Hart P, Bishop MT, Barron RM

Biochem Soc Trans. 2006 Dec; 34 (Pt 6):1155-8

TSEs (transmissible spongiform encephalopathies) are neurodegenerative diseases of various mammalian species, the best known of which include BSE (bovine spongiform encephalopathies) in cattle, CJD (Creutzfeldt-Jakob disease) in humans, scrapie in sheep and CWD (chronic wasting disease) in deer. This review examines the emergence of various TSE strains and their transmission, and discusses disease surveillance and control.

Epidemiología



The effectiveness of contact tracing in emerging epidemics

klinkenberg d, Fraser C, Heesterbeek H

PLoS ONE. 2006 Dec; 1: 1-7

BACKGROUND: Contact tracing plays an important role in the control of emerging infectious diseases, but little is known yet about its effectiveness. Here we deduce from a generic mathematical model how effectiveness of tracing

relates to various aspects of time, such as the course of individual infectivity, the (variability in) time between infection and symptom-based detection, and delays in the tracing process. In addition, the possibility of iteratively tracing of yet asymptomatic infecteds is considered. With these insights we explain why contact tracing was and will be effective for control of smallpox and SARS, only partially effective for foot-and-mouth disease, and likely not effective for influenza. **METHODS AND FINDINGS:** We investigate contact tracing in a model of an emerging epidemic that is flexible enough to use for most infections. We consider isolation of symptomatic infecteds as the basic scenario, and express effectiveness as the proportion of contacts that need to be traced for a reproduction ratio smaller than 1. We obtain general results for special cases, which are interpreted with respect to the likely success of tracing for influenza, smallpox, SARS, and foot-and-mouth disease epidemics. **CONCLUSIONS:** We conclude that (1) there is no general predictive formula for the proportion to be traced as there is for the proportion to be vaccinated; (2) variability in time to detection is favourable for effective tracing; (3) tracing effectiveness need not be sensitive to the duration of the latent period and tracing delays; (4) iterative tracing primarily improves effectiveness when single-step tracing is on the brink of being effective.

<http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=1762362&blobtype=pdf>

Fiebre Aftosa



The effect of vaccination on foot and mouth disease virus transmission among dairy cows

Orsel K, Jong MC, Bouma A, Stegeman JA, Dekker A

Vaccine. 2007 Jan; 25 (2): 327-35

The aim of this study was to quantify the effect of a single vaccination of dairy cows on foot and mouth disease virus (FMDV) transmission. To estimate if vaccination could significantly reduce virus transmission, we performed two replicates of a transmission experiment with one group of vaccinated and one group of non-vaccinated dairy cows (ten animals per group). Half of both groups were intranasally inoculated, with FMDV field isolate O/NET2001, and housed with the other half of the group (contact-exposed cows) from the next day onwards. Virus transmission was quantified by estimating the reproduction ratio R , which is the average number of secondary cases caused by one infectious animal. In the non-vaccinated groups all cows became infected and $R(nv)$ was significantly above 1. In the vaccinated groups infection was demonstrated in three inoculated cows, and no transmission was observed ($R(v)$ was 0, not significantly below 1). Transmission was significantly reduced in the groups of

vaccinated cows when compared to the groups of unvaccinated cows. Our findings indicate that after a single vaccination cows are protected against infection of FMD and that most likely no virus transmission will occur within a vaccinated herd.

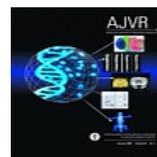


Foot-and-mouth disease virus 3C protease: Recent structural and functional insights into an antiviral target

Curry S, Roque-Rosell N, Zunszain PA, Leatherbarrow RJ

Int J Biochem Cell Biol. 2007; 39 (1): 1-6

The 3C protease from foot-and-mouth disease virus (FMDV 3C(pro)) is critical for viral pathogenesis, having vital roles in both the processing of the polyprotein precursor and RNA replication. Although recent structural and functional studies have revealed new insights into the mechanism and function of the enzyme, key questions remain that must be addressed before the potential of FMDV 3C(pro) as an antiviral drug target can be realised.



Modeled detection time for surveillance for foot-and-mouth disease virus in bulk tank milk

Thurmond MC, Perez AM

Am J Vet Res. 2006 Dec; 67 (12): 2017-24

OBJECTIVE: To estimate when foot-and-mouth disease virus (FMDV) would first be detected in bulk tank milk of dairies after exposure to FMDV. **SAMPLE POPULATION:** Hypothetical dairy herds milking 100, 500, or 1,000 cows. **PROCEDURES:** For each day after herd exposure to FMDV, infection, milk yield, and virolactia re simulated for individual cows with low and high rates of intraherd transmission to estimate when a PCR assay would detect virus in bulk tank milk. Detection limits were based on assumptions for the number of virus genomes per milliliter of milk and for analytical sensitivity of a PCR assay. **RESULTS:** A mean of 10% of the cows was predicted to have FMD lesions from 7 to 8 days and from 13.5 to 15 days after herd exposure for herds with high and low intraherd transmission rates, respectively. Herd bulk milk volume decreased by 10% by 8.5 to 9.5 days and by 15 to 16.5 days after herd exposure for herds with high and low transmission rates, respectively. Mean times by which FMDV would be first detected in bulk milk were 2.5 days and 6.5 to 8 days after herd exposure, which were extended for 10 to 11 days and 17 to 18 days for herds with high and low transmission rates, respectively. **CONCLUSIONS AND CLINICAL RELEVANCE:** PCR screening of bulk milk for FMDV would likely detect FMDV in dairy herds

several days sooner than might be expected for owner reporting of clinical signs and thus should be worthy of consideration for regional, national, or global FMD surveillance.



Modelling the initial spread of foot-and-mouth disease through animal movements

Green DM, Kiss IZ, Kao RR
Proc Royal Soc Biol Sci. 2006 Nov 7; 273 (1602): 2729-35

Livestock movements in Great Britain (GB) are well recorded and are a unique record of the network of connections among livestock-holding locations. These connections can be critical for disease spread, as in the 2001 epidemic of foot-and-mouth disease (FMD) in the UK. Here, the movement data are used to construct an individual-farm-based model of the initial spread of FMD in GB and determine the susceptibility of the GB livestock industry to future outbreaks under the current legislative requirements. Transmission through movements is modelled, with additional local spread unrelated to the known movements. Simulations show that movements can result in a large nationwide epidemic, but only if cattle are heavily involved, or the epidemic occurs in late summer or early autumn. Inclusion of random local spread can considerably increase epidemic size, but has only a small impact on the spatial extent of the disease. There is a geographical bias in the epidemic size reached, with larger epidemics originating in Scotland and the north of England than elsewhere.



Recombination patterns in aphthoviruses mirror those found in other picornaviruses

Heath L, van der Walt E, Varsani A, Martin DP
J Virol. 2006 Dec; 80 (23): 11827-32

Foot-and-mouth disease virus (FMDV) is thought to evolve largely through genetic drift driven by the inherently error-prone nature of its RNA polymerase. There is, however, increasing evidence that recombination is an important mechanism in the evolution of these and other related picornaviruses. Here, we use an extensive set of recombination detection methods to identify 86 unique potential recombination events among 125 publicly available FMDV complete genome sequences. The large number of events detected between members of different serotypes suggests that horizontal flow of sequences among the serotypes is relatively common and does not incur severe fitness costs. Interestingly, the distribution of recombination breakpoints was found to be largely nonrandom. Whereas there are clear breakpoint cold spots within the structural genes, two statistically significant hot spots precisely separate these from the nonstructural genes. Very

similar breakpoint distributions were found for other picornavirus species in the genera Enterovirus and Teschovirus. Our results suggest that genome regions encoding the structural proteins of both FMDV and other picornaviruses are functionally interchangeable modules, supporting recent proposals that the structural and nonstructural coding regions of the picornaviruses are evolving largely independently of one another.



Serological and mucosal immune responses after vaccination and infection with FMDV in pigs

Eblé PL, Bouma A, Weerdmeester K, Stegeman JA, Dekker A

Vaccine 2007 Jan; 25 (6): 1043-54

The aim of this study was to determine a possible correlation between humoral immune responses shortly after vaccination and protection against foot-and-mouth disease virus (FMDV) infection and to study the serological and mucosal antibody responses after vaccination and infection.

We used three groups of ten pigs, one non-vaccinated group, one group vaccinated with a single dose vaccine and one group vaccinated with a four-fold dose vaccine. At 7 days post vaccination, five pigs per group were challenged intra-dermally with FMDV O TAW 3/97 and the remaining pigs of each group were contact-exposed to the inoculated pigs. In each group, virus excretion and number of contact infections were quantified. The serological and mucosal antibody responses were evaluated until 116 days post infection.

Vaccination resulted in a significant decrease of virus excretion. Stepwise linear regression analysis of variables from individual vaccinated pigs revealed the virus excretion after challenge to be correlated with neutralising antibody titres at the day of challenge ($p < 0.01$). In serum and OPF samples comparable isotype-specific antibody responses (IgM, IgG and IgA), could be detected after vaccination as well as after infection. Remarkably, the pigs with the highest IgA responses after vaccination were protected against contact exposure. After infection, a long lasting (up to 116 dpi) IgA response was seen in the non-vaccinated and to a lesser extent in the single dose vaccinated pigs. The induction of NSP antibodies in the vaccinated pigs after infection was lower and of shorter duration as compared to the non-vaccinated infected pigs.

This experiment shows that vaccination can reduce virus excretion in pigs, which will contribute to reduced transmission of FMDV in the field, even if the pigs are not fully protected. Moreover, vaccines that induce local IgA responses may be more effective, which merits further investigation.



Structural and mutagenic analysis of foot-and-mouth disease virus 3C protease reveals the role of the beta-ribbon in proteolysis

Sweeney TR, Roque-Rosell N, Birtley JR, Leatherbarrow RJ, Curry S
J Virol. 2007 Jan; 81 (1): 115-24

The 3C protease (3C(pro)) from foot-and-mouth disease virus (FMDV), the causative agent of a widespread and economically devastating disease of domestic livestock, is a potential target for antiviral drug design. We have determined the structure of a new crystal form of FMDV 3C(pro), a chymotrypsin-like cysteine protease, which reveals features that are important for catalytic activity. In particular, we show that a surface loop which was disordered in previous structures adopts a beta-ribbon structure that is conformationally similar to equivalent regions on other picornaviral 3C proteases and some serine proteases. This beta-ribbon folds over the peptide binding cleft and clearly contributes to substrate recognition. Replacement of Cys142 at the tip of the beta-ribbon with different amino acids has a significant impact on enzyme activity and shows that higher activity is obtained with more hydrophobic side chains. Comparison of the structure of FMDV 3C(pro) with homologous enzyme-peptide complexes suggests that this correlation arises because the side chain of Cys142 contacts the hydrophobic portions of the P2 and P4 residues in the peptide substrate. Collectively, these findings provide compelling evidence for the role of the beta-ribbon in catalytic activity and provide valuable insights for the design of FMDV 3C(pro) inhibitors.

Influenza Aviar



Avian influenza: an agricultural perspective
 Morgan A
J Infect Dis. 2006 Nov;194 Suppl 2:S139-46

Recent outbreaks of infection with highly pathogenic H5N1 strains of avian influenza virus in poultry in Asia, Africa, Europe, and the Middle East have raised concern over the potential emergence of a pandemic strain that can easily infect humans and cause serious morbidity and mortality. To prevent and control a national outbreak, the US Department of Agriculture (USDA) conducts measures based on the ecology of avian influenza viruses. To prevent an outbreak in the United States, the USDA conducts surveillance of bird populations, restrictions on bird importation, educational outreach, and regulation of agricultural practices, in collaboration with local, state, and federal organizations. To manage an outbreak, the

USDA has in place a well-established emergency management system for optimizing efforts. The USDA also collaborates with international organizations for disease prevention and control in other countries.

http://www.journals.uchicago.edu/JID/journal/issues/v194nS2/36893/36893_web.pdf



Precauciones en la atención de pacientes hospitalizados por influenza aviar H5N1

Fica C A, Cifuentes D M, Ajenjo H MC, Delpiano M L, Febre V N, Medina L W, Parada E Y

Rev Chilena Infectol. 2006 Dec; 23 (4): 290-6

Diferentes agencias han propuesto guías para el control de infecciones por influenza aviar durante la atención de los pacientes afectados, con el objeto de disminuir el riesgo de transmisión cruzada hacia otros pacientes y hacia al personal de salud. La guía elaborada por este comité recoge las diferentes recomendaciones y entrega una propuesta adaptada a nuestro medio. Forman parte central de ellas, la hospitalización en pieza individual y la cohorte de pacientes, el uso de mascarillas tipo N95 (de alta eficiencia), la aplicación de prácticas de higiene de manos en el personal, guantes de procedimientos desechables y el uso de gafas protectoras al acercarse al paciente o cuando se generan aerosoles. Las precauciones requieren también la minimización de accidentes cortopunzantes y la toma de exámenes y su transporte adecuado al laboratorio. A pesar de que no se ha documentado una transmisión por aerosoles para influenza aviar, y que su principal mecanismo de transmisión ocurre por gotas y secreciones, se considera prudente aplicar precauciones para transmisión por aerosoles debido a la elevada letalidad de esta enfermedad, a la ausencia de vacunas protectoras disponibles actualmente, a la eficacia incierta de la terapia antiviral y a la transmisión por aerosoles documentada para influenza humana en espacios cerrados.

http://www.scielo.cl/scielo.php?script=sci_arttext&pid=S0716-10182006000400001&lng=en&nrm=



Rapid and Highly Informative Diagnostic Assay for H5N1 Influenza Viruses

Pourmand N, Diamond L, Garten R, Erickson JP, Kumm J, Donis RO, Davis RW
PLoS ONE. 2006 Dec;1: 1-9

A highly discriminative and information-rich diagnostic assay for H5N1 avian influenza would meet immediate patient care needs and provide valuable information for public health interventions, e.g., tracking of new and more dangerous variants by geographic area as well as avian-to-human or human-to-human transmission. In the present study, we have designed a rapid assay based on multilocus nucleic acid sequencing that focuses on

the biologically significant regions of the H5N1 hemagglutinin gene. This allows the prediction of viral strain, clade, receptor binding properties, low- or high-pathogenicity cleavage site and glycosylation status. H5 HA genes were selected from nine known high-pathogenicity avian influenza subtype H5N1 viruses, based on their diversity in biologically significant regions of hemagglutinin and/or their ability to cause infection in humans. We devised a consensus pre-programmed pyrosequencing strategy, which may be used as a faster, more accurate alternative to de novo sequencing. The available data suggest that the assay described here is a reliable, rapid, information-rich and cost-effective approach for definitive diagnosis of H5N1 avian influenza. Knowledge of the predicted functional sequences of the HA will enhance H5N1 avian influenza surveillance efforts.

<http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=1762361&blobtype=pdf>

Inocuidad de los Alimentos



Information systems in food safety management

McMeekin TA, Baranyi J, Bowman J, Dalgaard P, Kirk M, Ross T, Schmid S, Zwietering MH

Int J Food Microbiol. 2006

Dec;112 (3): 181-94

Information systems are concerned with data capture, storage, analysis and retrieval. In the context of food safety management they are vital to assist decision making in a short time frame, potentially allowing decisions to be made and practices to be actioned in real time.

Databases with information on microorganisms pertinent to the identification of foodborne pathogens, response of microbial populations to the environment and characteristics of foods and processing conditions are the cornerstone of food safety management systems. Such databases find application in:

- Identifying pathogens in food at the genus or species level using applied systematics in automated ways.
- Identifying pathogens below the species level by molecular subtyping, an approach successfully applied in epidemiological investigations of foodborne disease and the basis for national surveillance programs.
- Predictive modelling software, such as the Pathogen Modeling Program and Growth Predictor (that took over the main functions of Food Micromodel) the raw data of which were combined as the genesis of an international web based searchable database (*ComBase*).
- Expert systems combining databases on microbial characteristics, food composition and processing information with the resulting "pattern match" indicating problems that may arise from

changes in product formulation or processing conditions.

- Computer software packages to aid the practical application of HACCP and risk assessment and decision trees to bring logical sequences to establishing and modifying food safety management practices.

In addition there are many other uses of information systems that benefit food safety more globally, including:

- Rapid dissemination of information on foodborne disease outbreaks via websites or list servers carrying commentary from many sources, including the press and interest groups, on the reasons for and consequences of foodborne disease incidents.
- Active surveillance networks allowing rapid dissemination of molecular subtyping information between public health agencies to detect foodborne outbreaks and limit the spread of human disease.
- Traceability of individual animals or crops from (or before) conception or germination to the consumer as an integral part of food supply chain management.
- Provision of high quality, online educational packages to food industry personnel otherwise precluded from access to such courses.



Systematic environmental evaluations to identify food safety differences between outbreak and nonoutbreak restaurants

Hedberg CW, Smith SJ, Kirkland E, Radke V, Jones TF,

Selman CA; EHS-Net Working Group
J Food Prot. 2006 Nov; 69 (11): 2697-702

Restaurants are important settings for foodborne disease transmission. The Environmental Health Specialists Network (EHS-Net) was established to identify underlying factors contributing to disease outbreaks and to translate those findings into improved prevention efforts. From June 2002 through June 2003, EHS-Net conducted systematic environmental evaluations in 22 restaurants in which outbreaks had occurred and 347 restaurants in which outbreaks had not occurred. Norovirus was the most common foodborne disease agent identified, accounting for 42% of all confirmed foodborne outbreaks during the study period. Handling of food by an infected person or carrier (65%) and bare-hand contact with food (35%) were the most commonly identified contributing factors. Outbreak and nonoutbreak restaurants were similar with respect to many characteristics. The major difference was in the presence of a certified kitchen manager (CKM); 32% of outbreak restaurants had a CKM, but 71% of nonoutbreak restaurants had a CKM (odds ratio of 0.2; 95% confidence interval of 0.1 to 0.5). CKMs were associated with the absence of

bare-hand contact with foods as a contributing factor, fewer norovirus outbreaks, and the absence of outbreaks associated with *Clostridium perfringens*. However, neither the presence of a CKM nor the presence of policies regarding employee health significantly affected the identification of an infected person or carrier as a contributing factor. These findings suggest a lack of effective monitoring of employee illness or a lack of commitment to enforcing policies regarding ill food workers. Food safety certification of kitchen managers appears to be an important outbreak prevention measure, and managing food worker illnesses should be emphasized during food safety training programs.

Nicho Ecológico



Learning the ecological niche

Slagsvold T, Wiebe KL
Proc Biol Sci. 2007 Jan; 274 (1606): 19-23

A cornerstone of ecological theory is the ecological niche. Yet little is known about how individuals come to adopt it: whether it is innate or learned. Here, we report a cross-fostering experiment in the wild where we transferred eggs of blue tits, *Cyanistes caeruleus*, to nests of great tits, *Parus major*, and vice versa, to quantify the consequences of being reared in a different social context, but in an environment otherwise natural to the birds. We show that early learning causes a shift in the feeding niche in the direction of the foster species and that this shift lasts for life (foraging conservatism). Both species changed their feeding niches, but the change was greater in the great tit with its less specialized feeding behaviour. The study shows that cultural transmission through early learning is fundamental to the realization of ecological niches, and suggests a mechanism to explain learned habitat preference and sympatric speciation in animals.

Rabia



Spatial control of rabies on heterogeneous landscapes

Russell CA, Real LA, Smith DL
PLoS ONE. 2006 Dec; 1: e27

Rabies control in terrestrial wildlife reservoirs relies heavily on an oral rabies vaccine (ORV). In addition to direct ORV delivery to protect wildlife in natural habitats, vaccine corridors have been constructed to control the spread; these corridors are often developed around natural barriers, such as rivers, to enhance the effectiveness of vaccine deployment. However, the question of how to optimally deploy ORV around a river (or other natural barrier) to best exploit the

barrier for rabies control has not been addressed using mathematical models. Given an advancing epidemic wave, should the vaccine be distributed on both sides of barrier, behind the barrier, or in front of it? Here, we introduce a new mathematical model for the dynamics of raccoon rabies on a spatially heterogeneous landscape that is both simple and realistic. We demonstrate that the vaccine should always be deployed behind a barrier to minimize the recurrence of subsequent epidemics. Although the oral rabies vaccine is sufficient to induce herd immunity inside the vaccinated area, it simultaneously creates a demographic refuge. When that refuge is in front of a natural barrier, seasonal dispersal from the vaccine corridor into an endemic region sustains epidemic oscillations of raccoon rabies. When the vaccine barrier creates a refuge behind the river, the low permeability of the barrier to host movement limits dispersal of the host population from the protected populations into the rabies endemic area and limits subsequent rabies epidemics.

<http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=1762310&blobtype=pdf>

Salud Pública / Salud Pública Veterinaria



Veterinary medicine and public health at CDC

King LJ, Centers for Disease Control and Prevention

MMWR Morb Mortal Wkly Rep. 2006 Dec; 55 Suppl 2:7-9

People readily associate the role of veterinarians with private veterinary practice focused on pets and farm animals, but the true dimensions and contributions of veterinary medicine are much broader and reflect expanding societal needs and contemporary challenges to animal and human health and to the environment. Veterinary medicine has responsibilities in biomedical research; ecosystem management; public health; food and agricultural systems; and care of companion animals, wildlife, exotic animals, and food animals. The expanding role of veterinarians at CDC reflects an appreciation for this variety of contributions. Veterinarians' educational background in basic biomedical and clinical sciences compare with that of physicians. However, unlike their counterparts in human medicine, veterinarians must be familiar with multiple species, and their training emphasizes comparative medicine. Veterinarians are competent in preventive medicine, population health, parasitology, zoonoses, and epidemiology, which serve them well for careers in public health. The history and tradition of the profession always have focused on protecting and improving both animal health and human health.

<http://www.cdc.gov/mmwr/preview/mmwrhtml/su5502a4.htm>

Seminarios / Congresos / Cursos

CIES International Food Safety Conference

31 January – 2 February, 2007
Munich, Germany
<http://www.ciesfoodsafety.com/>

Curso de auditores internos de calidad y seguridad alimentaria

(IFS, BRC, ISO22000, ISO9001...)
07 - 08 Febrero, 2007, Barcelona (España)
http://www.silliker.es/uploads/qnral/Curso_Auditores_Feb07.pdf

Simposio Internacional en Seguridad de la carne: del matadero al consumidor

14 - 15 Febrero, 2007, Valencia, España
<http://meatsafetyvalencia2007.congress-uex.com/Home.cfm>

International Meeting on Emerging Diseases and Surveillance (IMED 2007)

23 – 25 February, 2007, Vienna, Austria
<http://imed.isid.org/>



XXXIV Reunión Ordinaria de la Comisión Sudamericana para la Lucha contra la Fiebre Aftosa

15 - 16 de Marzo de 2007, Caracas, Venezuela
Y

Seminario Internacional "Nivel Local: Eslabón Crítico en la Gerencia de los Programas de Sanidad Animal"

12 - 13 de **Marzo** de 2007, Caracas, Venezuela
<http://www.panaftosa.org.br/>

Programa de formación a distancia en Desarrollo Local y Gestión Social en Salud

(OPS y OIT)
12 marzo – 31 septiembre 2007
<http://www.paho.org/Spanish/DPM/SHD/HR/convocat-curso-gestion-social07.htm>

Vaccination: a tool for the control of avian influenza

An OIE/FAO/IZSve scientific conference
20-22 March 2007, Verona, Italy
<http://www.avianfluvaccine2007.org/>

SVEPM 2007 - Conference of the Society for Veterinary Epidemiology and Preventive Medicine

28 - 30 March 2007
Dipoli, Helsinki/Espoo, Finland
<http://www.svepm.org.uk/conferences.php?view=3>

2nd International Symposium on Animal Disease Control in the 21st Century

23 – 25 April 2007
Greifswald-Insel Riems (Germany)
http://www.oie.int/download/ANNOUNCEMENT_MEETING/Animal_Disease.pdf

II Congresso Nacional de Saúde Pública Veterinária

8 - 11 de Outubro de 2007
Fortaleza, Ceará, Brasil
<http://www.abspv.org.br/congressos/2007/index.htm>

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