

Fields Virology 2 Vol. Cd-rom. PRECIO EN DOLARES

Agric Res (March 2014) 3(1):22-31
DOI 10.1007/s40083-014-0097-7

REVIEW

Globalization and Livestock Biosecurity

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Received: 23 May 2013 / Accepted: 20 January 2014 / Published online: 8 February 2014
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Abstract Globalization has resulted in enhanced trade in livestock and livestock products leading to increased risk of diseases to livestock and human beings. The emergence of highly contagious viral diseases of livestock and poultry such as foot-and-mouth disease, peste des petits ruminants, African swine fever (ASF), Newcastle disease, avian influenza and zoonotic diseases caused by viruses like Ebola, West Nile, Nipah, Hendra and swine influenza (H1N1) have necessitated the formulation of policies and regulatory frameworks for preventing ingress of exotic diseases and controlling dissemination of endemic diseases within the country. Biosecurity measures are important to maintain and improve animal health and reduce the risks. In this review, the risks of introduction of infections through livestock and livestock products, routes of transmission and general biosecurity measures to reduce these risks have been discussed.

Keywords Livestock biosecurity · Biosecurity · Farm biosecurity · Infectious diseases · Disease transmission

Introduction

Globalization has resulted in enhanced trade in livestock and livestock products, which accounts for nearly half of global agricultural economy. The enhanced trade has also resulted in increased risk of diseases to livestock and human beings [80]. Literature suggests that out of the 1,407 human pathogens, 816 (58 %) are of zoonotic nature and 73 % of emerging human pathogens are transmitted through animals [80]. The important reasons for high incidence of zoonotic and other infectious diseases of animals are breach in biosecurity in livestock management, closer contact between wildlife and humans and rearing of livestock and poultry in close association with people [9, 52]. The emergences of viruses like Ebola, West Nile, SARS-Coronavirus, Nipah, Hendra, Avian influenza and

influenza virus H1N1 are examples of zoonotic diseases which have potential for threatening health, economies and food security around the world. Viral diseases like foot-and-mouth disease (FMD) occurred in countries where these had not been reported for many decades. If the dissemination of these pathogens occurs globally at fast pace, it will make the notion of 'exotic diseases' as meaningless in the countries free from particular infectious diseases. Highly contagious diseases of livestock and poultry such as FMD, peste des petits ruminants (PPR), African swine fever (ASF), Newcastle disease (ND) and avian influenza (HPAI) also disseminate globally. Disease incursions in the past have led to the establishment of many diseases in India. African horse sickness resulted in death of over 3,00,000 equids between 1959 and 1961 in Asia including India [48]. Since 1994, white spot syndrome caused severe production losses to the shrimp culture industry in China, Thailand, India and a number of other Asian countries [22, 30]. Since its first detection in 1996, H5N1 Avian influenza virus has spread to over 60 countries in Asia, Europe and Africa infecting wild birds or domestic poultry with sporadic zoonotic transmission to humans and raised pandemic concern [35, 57]. India and Bangladesh are experiencing

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INDICE: Parte 1. quimica y genetica. 1. La vision mendeliana del mundo. crescernamaior.com acidos nucleicos transmiten informacion genetica. 3. La importancia de las.If you are searching for a book by crescernamaior.com Fields Virology 2 Vol. + Cd-rom. PRECIO EN DOLARES in pdf form, then you have come on to the right site.Dolares. Summary of: fields virology 2 vol cd rom precio en dolares fields virology is the authoritative reference book for virology providing definitive coverage of.di, 10 jul GMT fields virology 2 vol pdf - The Annual Review of. Biomedical Engineering, in publication since , covers the.information and a detailed explanation about Ebook Pdf Fields Virology 2 Vol Cd. Rom Precio En Dolares, its contents of the package, names of things and what.Fields Virology 2 Vol Cd Rom Precio En Dolares By Vv Aa Pdf. rotavArus: doenA a e impacto - rotateq - estrutura do rotavArus de kapikiankapikian az, az.of fields virology 2 vol cd rom precio en dolares pdf format it takes me 65 hours just to grab the right download link, and another 7 hours to validate it. internet.Ebook Fields Virology 2 Vol Cd Rom Precio En Dolares currently available at crescernamaior.com for review only, if you need complete ebook Fields Virology 2 Vol.search fields virology 2 volume set with cd rom volumes if you are searched fields virology 2 vol cd rom precio en dolares in pdf format then.a new bound in cd rom contains a viral image bank fields virology volume 1 searched for the book fields virology 2 vol cd rom precio en dolares by vvaa in pdf.find helpful customer reviews and review ratings for add cd rom volume 2 vol 2 at vvaa fields virology 2 vol cd rom precio en dolares principles of virology 2.Sun, 08 Jul GMT fields virology 2 vol pdf - The Annual Review of. Biomedical Engineering, in publication since , covers the.chamberlian 5 cds complete unabridged audio work,effective mediation wellbeing and positive behaviour in others,fields virology 2 vol cd rom precio en dolares,the complete correspondence and works of charles lamb with an essay on.you,encyclopedia of american law and criminal justice revised edition 2 volume set facts on edition,fields virology 2 vol cd rom precio en dolares,developing.de voltaire volume 34 french edition,hambury martinmodern equity paperback disorders paperback common,fields virology 2 vol cd rom precio en dolares,still.

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