

# Zoonotic viral infections transmitted by food: selected examples

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## Introduction

Although many zoonoses do not result in serious infection outcomes or even fatal consequences, these diseases may have enormous or long-lasting effects on a person's overall health and psychological well-being and could affect their ability to work.<sup>1</sup> Lack of concentration and daily discomfort may give rise to pain which could result in an increase in medical and other expenses.<sup>1</sup>

For the health of the community, it is of critical importance that zoonoses and food-associated infections and diseases are prevented and controlled.<sup>1,2</sup> The closest co-operation between animal owners and farmers with the veterinary and medical professions is an essential requirement.<sup>2</sup>

Zoonoses can be divided into the following categories, namely:

- a. Zoonoses caused by worms (helminths);
- b. Zoonoses caused by bacteria;
- c. Zoonoses caused by *Chlamydia sp*;
- d. Zoonoses caused by *Rickettsia sp*;
- e. Viral zoonoses;
- f. Parasitic zoonoses;
- g. Mycotic zoonoses and
- h. Zoonoses and food poisoning.<sup>1,3</sup>

The list of viral zoonoses is very extensive and some more can be added to the growing list for sub-Saharan Africa and nearby regions namely:

- A. Chikungunya virus;
- B. Herpes simplex viruses types 1 and 2;
- C. Influenza - current circulating strains;
- D. Lujo virus;
- E. Viral hepatitis;
- F. Wesselsbron disease;
- G. West Nile fever and
- H. Yellow fever.<sup>1,4,5</sup>

## Discussion-The Importance of Food of Animal Origin

Food poisoning is a specific disease arising soon after the ingestion

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of solid and/or liquids, such as milk, meat, fish eggs, marine and aquatic animals.<sup>6</sup> Table One illustrates a selected list of milk-borne diseases linked to zoonoses.<sup>1</sup>

**Table 1** Selected Milk-Borne Diseases and Zoonoses

Disease In Man	Man	Cow	Environment
<b>Selected Bacterial Diseases</b>			
Leptospirosis	-	+	+ (H2O)
<i>Staphylococcal Enterotoxigenesis</i>	+	+	-
<i>Streptococcal Infection</i>	+	+	-
<i>Salmonella sp</i>	+	-	+ (H2O)
<b>Rickettsial Diseases</b>			
Q-fever	-	+	+
<b>Viral Diseases</b>			
Infectious Hepatitis*	+	-	+ (H2O)
Rift Valley Fever	-	+	-
<b>Protozoal Diseases</b>			
Amoebiasis	+	-	+ (H2O)
<b>Diseases Caused by Worms</b>			
Cysticercosis	+	-	-
Enterobiasis	+	-	-

\*Infectious hepatitis may not always have a zoonotic origin and most likely manifests as inflammation of the liver.

H<sup>2</sup>O: could play an important role in the transmission of food borne diseases to man.

Food items frequently identified as the actual cause of viral disease outbreaks were reported from shellfish found in sewage-contaminated water.<sup>8,9</sup> In addition, the detection of human food-borne and the role of zoonotic viruses have been found on irrigated, agriculturally field grown strawberries.<sup>10</sup> Compared to other foodborne diseases, those caused by viruses are less severe and seldom fatal in adults.<sup>11</sup>

The following basic steps to prevent and control food poisoning are essential, namely:

- a. Healthy animals and hygienic production should be in place and sustained;
- b. Handling of food by healthy workers will limit food contamination;
- c. Food should be chilled to 4 degrees Celsius;
- d. All food products of animal origin should be subject to adequate heating (pasteurisation, sterilising boiling or UHT-processing of milk) and
- e. Preservation by canning or cooking other food before consumption is an inherent requirement.<sup>2,6</sup>

## Conclusion

Over time most, if all food-borne pathogens have evolved effective strategies to utilise totally or partly food as a vehicle to transfer from animals to humans.<sup>12</sup> These strategies are complex and each of these food borne pathogens can occupy a unique ecological niche within that specific food-related cycle.<sup>1,5</sup>

Viruses do not grow in food. Viruses need living cells to replicate and almost all food-borne viruses are human pathogens.<sup>13</sup> Most food-borne viruses are highly infectious in many human cases and can spread rapidly from individual to individual.<sup>14</sup>

There is no systemic surveillance for food-borne viral diseases, however most countries do have some level of reporting food-borne illnesses and outbreaks but it is possible few of these systems actually include specific viral-associated food-borne illnesses.<sup>6</sup> A major hurdle in controlling food-borne viral disease is the detection of viruses in foods and viral evolution is continuously, challenging even current molecular techniques.<sup>15</sup> It is important to understand the fundamental difference between viral and bacterial pathogens. This could ensure the development of strategies that can control both classes of pathogens. The food market is a now powerful global entity and controlling viral food-borne illness is a major priority.

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## Conflicts of interest

None.

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