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Belkisyolé Alarcón de Noya  
Oscar Noya González  
Lucy J. Robertson

*Trypanosoma  
cruzi* as a  
Foodborne  
Pathogen

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*This work is dedicated to:  
Ramón Gustavo Alarcón.*



# Preface

Chagas disease is caused by a highly controversial, versatile, and startling parasite, *Trypanosoma cruzi*. *Controversial* because its pathogenic mechanisms are still a matter of discussion, particularly why some patients progress to a severe cardiomyopathy while others do not; treatment options are also a subject of debate. *Versatile* because new epidemiological circumstances result in it adapting to new transmission routes and make it ambiguous in its presentation, such that we are unable to delimit the disease to a single profile. *Startling* because we are continuously surprised by the various manifestations of the disease and the adaptations of the parasite to different vectors, reservoirs, and transmission circumstances.

Foodborne Chagas disease, which was demonstrated as long ago as 1967 and has resulted in numerous outbreaks, nevertheless remains unknown to a large proportion of health sector personnel, and its importance and impact seem to be underestimated by different public health officials. Although oral transmission has been postulated to be the usual transmission route between wild and domestic animals, there still seems some reluctance in academic sectors to admit the importance of this transmission mechanism. This is worrying as this transmission route is highly efficient, results in severe forms of disease due to the high parasite load of the initial inoculum and its rapid multiplication in the submucosa of the stomach, and has the potential to impact on large numbers of people when a common vehicle becomes contaminated. Outbreak scenarios, which usually concern small groups or families, but have been known to involve hundreds and have the potential to infect thousands, are difficult medical emergencies to handle. This is not only because of the large numbers of people that may be exposed, but also because of the potential for serious complications, such as cases of severe cardiac and pericardial effusions arrhythmias; if not diagnosed early and treated appropriately by well-trained specialists under optimal hospital conditions, then the mortality rate can be high.

Although research on foodborne Chagas disease is progressing, with studies on fields from epidemiology to molecular biology, there are still many neglected areas and several important topics lack data and research. This book seeks to draw attention to these areas where our knowledge is limited, as well as those areas where research is thorough, and kindle understanding and recognition of important facets

of this disease and transmission routes of infection. This book is the result of a collaborative effort between two groups with a special interest in this topic: Belkisyolé Alarcón de Noya and Oscar Noya from Instituto de Medicina Tropical, Facultad de Medicina, Universidad Central de Venezuela, are experts in Chagas disease and Lucy J. Robertson from the Norwegian University of Life Sciences has a close interest in a range of foodborne parasites, with a research focus on detection of contamination and interruption of foodborne transmission. In addition, some chapters are the work of contributors and colleagues from the Venezuelan team who were asked to contribute on the basis of their collaborative work and experience in the management of some of the outbreaks.

This brief thus attempts to summarize and highlight the main aspects of the biology of *Trypanosoma cruzi* and describe the main strategies of invasion, the epidemiology, most notably emphasizing the determinants of oral transmission, and the increase in prevalence. Recorded outbreaks and cases are described along with prophylactic measures. Original pictures depict geographical distributions, risk factors, and clinical manifestations. For teaching purposes, oral and vector-borne transmission routes are compared and final remarks are included. The purpose is both to elucidate general aspects of food as a transmission vehicle for parasites and to look at this in the particular context of *T. cruzi*. In addition, experiences in the management of outbreaks in Venezuela are provided and perspectives on those factors that are of relevance for oral transmission — that we believe should be firmly established as a dangerous transmission route, that may cause rapid morbidity and complications with high mortality.

Throughout the nine chapters of this book, we have attempted to keep technical details and jargon to a minimum such that the information is accessible to all, with particular hope that it can be read by health personnel who manage children and adults in the emergency room and also by public health officials and international food safety organizations, particularly those who still appear to doubt the importance of Chagas disease as a foodborne parasitic disease.

We would particularly like to thank the following additional contributing authors: Zoraida Díaz Bello, Cecilia Colmenares, and Raiza Ruiz-Guevara — all from Instituto de Medicina Tropical, Facultad de Medicina, Universidad Central de Venezuela.

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