RESEARCH NOTE

HUMAN CONSUMPTION OF RUMEN FLUKES OF CATTLE IN INDIA

PC Sarmah[1], R Laha[2], K Bhattacharjee[1], A Goswami[2], M Raquib[1] and P Kakati[1]

[1]Department of Parasitology, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam; [2]ICAR Research Complex for NEH Region, Meghalaya, India

Abstract. The practice of eating rumen flukes of cattle by a section of people living in Meghalaya, a north eastern State of India, is reported in this communication. Economically backward, some rural people belonging to Khasi, Jaintia, Garo, and Karbi tribes of Christian and Nepali communities who eat beef are accustomed to consuming cooked flukes during breakfast, meals, and also along with rice beer or alcohol. Inspection of the rumens of cattle during slaughter indicated a prevalence of flukes belonging to *Cotylophoron, Paramphistomum, Calicophoron, Gastrothylax*, and *Fischoederius* genera in 74% cases, and their collection from rumen ranged approximately from 50g to 600g. Biochemical analysis of flukes found 12.60% total protein, 0.78% fat, and 0.87% ash on fresh weight basis. High prevalence of flukes, easy visualization in rumen, their bulk collection, presence of nutritive value, absence of any ill effect, and lack of imminent danger of transmissibility are believed to be the rationales influencing their consumption by people. It is suggested that dietary benefits obtained from flukes might contribute to the energy transfer and inclusion in the food web.

Keywords: rumen flukes, human consumption, India

INTRODUCTION

Parasites are widespread in nature and are best known for harmful effects in their hosts (Johnson *et al*, 2010). However, in the history of parasitology, many examples can be found of the benefits of using parasites as vermifuge, aphrodisiac, slimming pills, and for treatment of many disease conditions in ancient times (Hoeppli, 1959). Current research and clinical trials have demonstrated several helminths as immunomodulators, and the helminthic therapy or worm therapy worthwhile in curing immunological diseases in man (Elliott and Weinstock, 2009). Furthermore, some parasites are prized as a delicacy, with evident pleasure (Overstreet, 2003), and are known to have the potential to transfer substantial biomass and energy in the food chain, especially when consumption does not lead to transmission of disease (Johnson *et al*, 2010). Although many reports on the

Correspondence: K Bhattacharjee, Department of Parasitology, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati-781022, Assam, India.
Tel: +91 9864357161
E-mail: kantabhatta@gmail.com

custom of eating parasites are available from several parts of the world (Overstreet, 2003), authentic documentation of such information in India is very limited. With this in mind, the aim of this communication is to document the consumption of rumen flukes practiced by tribal people in Meghalaya, with supportive analysis on prevalence in cattle and their nutritive value.

MATERIALS AND METHODS

This investigation was instigated by the observation of the collection of rumens by adults for sale as a meat by-product and the collection of rumen flukes by children at a cattle abattoir situated at Kiling, Ribhoi District of Meghalaya. Cattle slaughtered regularly at the abattoir were mostly indigenous open-grazed animals procured from different places of Assam. Persons engaged in the collection of rumens and reticula from the abattoir, separation of flukes, and their consumption were observed. Respondents (convenience sampling) were interviewed and their socio-economic status in respect of literacy, economic condition, and hygiene ascertained. Parasitological investigation was carried out by examining the rumen and reticulum of slaughtered cattle for the presence of flukes to determine their prevalence and the intensity of infection (worm burden) in positive cases. Flukes were collected and morphological identification was done according to standard guidelines (Yamaguti, 1958, 1971). Biochemical estimation of protein, fat, and ash in the flukes was made on fresh-weight basis in three replicates as per standard methods (Horwitz, 1990).

RESULTS

The whole process beginning with collection of rumen and reticulum, their transportation from the abattoir, separation of the flukes during washing of the organs and their cooking and consumption by people are depicted (Figs 1-6). Examination of rumens and reticula of 30 slaughtered cattle found 22 positive for flukes, with an estimate of 74% prevalence. The parasites belonged to *Fischoederius*, *Paramphistomum*, *Gastrothylax*, *Cotylophoron*, and *Calicophoron* genera. The weight of flukes recovered from the organs varied from 50 to 600g, with an average of 450 g/rumen. Biochemical estimation revealed 12.60% protein, 0.78% fat, and 0.87% ash in flukes on fresh weight basis.

It was found that people with marginal income and belonging to Khasi, Jaintia, Garo, Karbi and Nepali communities who eat beef and meat by-products (that is, rumen) were accustomed to eating of flukes in breakfast and other meals, or along with rice beer and alcohol.

People locally call it *Poaka*, which depending on its availability, is also sold at the places of collection. Flukes fried in cooking oil are consumed without any ill effects. The practice might be for delicacy and enjoyment of consuming with rice beer or alcohol and to some extent for nutrition as an alternative food source.

DISCUSSION

High rainfall, moderate temperature, and high humidity are the common features of climate of north eastern states of India. Favorable climatic condition, presence of watery bodies with abundant aquatic snails, and open grazing in aquatic/low lying pastures are the important contributing factors for such a high prevalence of trematode infection in

Fig 1–Collection of rumens at a local abattoir.

Fig 4–Separating flukes from rumen.

Fig 2–Transportation of rumens from abattoir for sale.

Fig 5–Flukes brought home for cooking.

Fig 3–Cleaning of rumens in water.

Fig 6–Consuming cooked flukes.

cattle of Assam as observed in the present investigation.

Similar findings were also recorded by Borkakoty *et al* (1984), Roy and Tandon (1992), and Tandon and Roy (2005), with a common remark that out of all trematode parasites, amphistomes were extensively prevalent in ruminants of the north eastern states. The biochemical estimations agreed with the findings of Chattar and Sharma (1980), and Gaur and Agarwal (1980).

During the interview, one of the person informed that the flukes, in addition, were also supplied to fish in the pond similar to their use as feed for chicken in Kolkata, as reported by Sey (1991).

Overstreet (2003) reported practices and customs of eating parasites similar to those of eating non-parasitic insects and other invertebrates worldwide by people for nutrition or pleasure. Natives of Arctic region are reported to devour larvae of *Oedemagena tarandi* (botfly), *Cephenemyia trompe* and *Cephenemyia phobifer* parasitic in species of caribou including reindeer (Rausch, 1951). Similarly, deer hunters in North America considered best part of eating deer to be the eating of giant liver fluke, *Fascioloides magna*, locally known as the 'little liver' (Johnson *et al*, 2010).

Availability of adult flukes, their easy detection and collection, the physical appearance of flukes that is similar to meat, and absence of adverse effect following consumption might be the contributory factors for preferring the flukes by the consumers. In view of abundance of rumen flukes in this region and lack of potential danger from the consumption of boneless or gristle-less flukes, the practice of eating might be environmentally friendly and offer a nutritional support to the diet due to energy content similar to beef.

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