01 | AVOID LEAVING DEAD SHEEP ON THE PASTURE

02 | KEEP YOUR DOGS FROM EATING RAW VISCERA

03 | KEEP YOUR DOGS FROM EATING DEAD SHEEP

04 | AVOID FREQUENTING UNKNOWN PASTURES

05 | REGISTER YOUR SHEEP IN NATIONAL DATABASE

06 | REGISTER YOUR DOG AT THE REGISTRY OFFICE

07 | NEVER ABANDON YOUR DOGS

08 | WASH FRUIT AND VEGETABLES THOROUGHLY

09 | TAKE CARE OF THE HYGIENE OF YOUR HANDS BEFORE MEALS

10 | ASK YOUR VETERINARY PRACTIONER FOR ADVICE

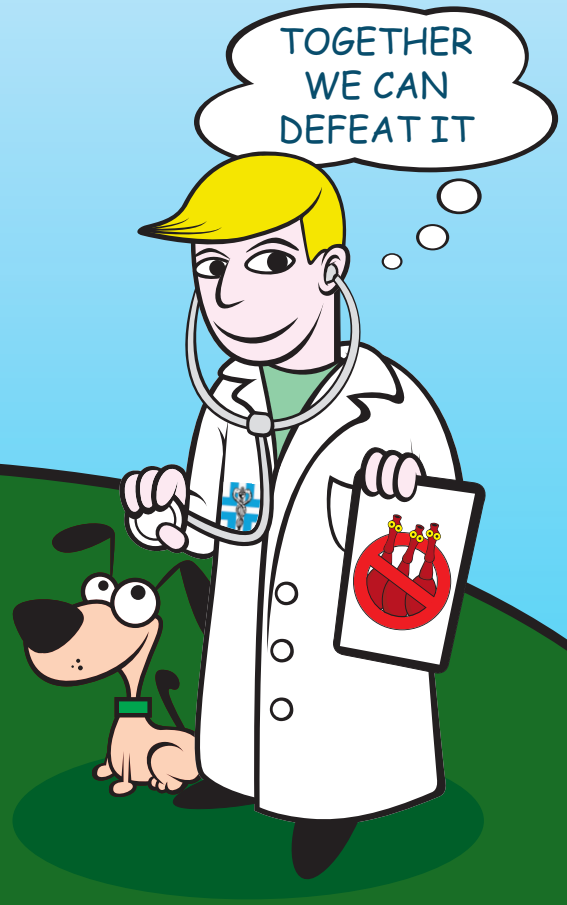
The **ECHINO-SAFE-MED** (New sustainable tools and innovative actions to control cystic ECHINOcoccosis in sheep farms in the MEDiterranean area: improvement of diagnosis and SAFEty in response to climatic changes) project aims to implement the pasture-based livestock farming systems by delivering sustainable and cost-effective tools, as well as innovative strategies to control cystic echinococcosis (CE) in sheep farms with the final goal to improve health, welfare and productivity of small ruminant livestock sector in the Mediterranean regions.

"The **ECHINO-SAFE-MED** consortium consists of scientists located in **7 countries in Europe** and beyond."

PRIMA
PARTNERSHIP FOR RESEARCH AND INNOVATION IN THE MEDITERRANEAN AREA

ECHINO SAFE MED

CYSTIC ECHINOCOCCOSIS



PARASITE

Echinococcus granulosus is a small tapeworm, less than 1 cm long, with a head (scolex) and a body (strobilus) composed of 3 or 4 segments, the proglottids, the last of which is filled with eggs.

DEFINITIVE HOSTS AND PREDILECTION SITE OF THE PARASITE

By definition, the definitive hosts are those animals where the parasite becomes an adult. The main definitive hosts are the dog and other canids, that harbor the parasite in the small intestine.

INTERMEDIATE HOSTS AND PREDILECTION SITE OF THE PARASITE

The intermediate hosts are represented by different species of domestic and selvatic ungulates (sheep, goats, cattle, buffaloes, pigs, equids, wild ruminants), marsupials, primates as well as humans, in which the larval form (metacestode,) as hydatid cyst or hydatid, develops in different organs, especially liver and lungs. The hydatid cyst may exceed 20 cm in diameter.

INFECTION

Dog and other definitive hosts become infected by eating offals of intermediate hosts containing larval forms (hydatid cysts) with the vital protoscoleces inside, mainly sheep livers and lungs slaughtered or dead and abandoned on pastures. The sheep and other intermediate hosts (including human) become infected by eating the eggs of the parasite (that resist in the environment for long periods) eliminated with the faeces by definitive hosts.

LIFE CYCLE

The life cycle describes the evolutionary phases of the parasite in animals, humans and the environment. The adult parasite, in the intestines of the dog and the other definitive hosts, releases proglottids full of eggs that are excreted in the external environment with the faeces. The proglottids release the eggs that contaminate the environment and food.

The eggs, once ingested by the intermediate hosts, release embryos (oncospheres) that cross the wall intestinal and reach the liver and/or lungs (80% of cases) or other locations, such as brain, eye, muscles, etc. where they give rise to the development hydatids. The cycle is completed when the organs of the intermediate hosts containing hydatids with vital protoscoleces are ingested by the dog (or other definitive hosts) in which the parasite develops up to adult cestode in the intestine.

CLINICAL SIGNS

The dog and other definitive hosts usually do not have symptoms. Also in sheep and other intermediate hosts, the symptoms of infection are often not obvious. In humans the symptomatology is variable, from absence of symptoms at very serious forms, potentially deadly. The nature and intensity of clinical manifestations depend on the number of cysts, their localization and evolution. The cyst's rupture can cause the infection in several regions of the body up to a lethal anaphylactic shock.

RISK TO HUMANS

The human, like the other intermediate hosts, becomes infected by eating eggs *E. granulosus* (excreted from the dog) that being very resistant in the external environment can contaminate foods, soil and water for a long time.