Assessment of Meat Lost Due Parasitic Infestation at Ghanawa

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DEDICATION

To Soul of my father
To my mother
To my husband and children
ACKNOWLEDGEMENTS

Thanks to God the Merciful and Almighty for giving me the strength to finish this work.

I am greatly indebted to my supervisor Dr. Khitma Hassan ElMalik for her great help and for her patience and support.

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ABSTRACT

Human requirement for protein are estimated to be 55 g per day for an adult man and 45 g for a woman.

Meat is a relatively concentrated source of protein of high quality (NPU 0.75 – 0.8), highly digestible, about 0.95 compared with 0.8 – 0.9 for many plant foods.

This some of carcass parts such offals represent an essential source of food for the poor sector in the community.

This work is carried out to show the amount of protein loss in partial and total condemnation of meat due to parasitic infections.

The information for this study was taken from Ganawa Slaughterhouse for local and export purposes.

The study had two parts in first records analysis for all condemnation, second condemnation analysis due to different parasites. This has achieved by taking the records of three years during 2004 – 2006.

As a result the ratio of parasitic causes to total causes of condemnations in cattle during 2004 – 2006 was 64, 95 and 65% for liver, 3, 4 and 6% for lung, 3.4% for head, 50% for offals and 50 – 60% for carcasses, these was due to different parasites such as fasciolasis, hydatidiosis and cysticercosis.

The monetary loss due to condemnation was estimated as 524240 Sudanese pound for liver losses.

It is obvious that the control management for parasites were not sufficient as there are similarity at the infection rate without change. So there must be an effective control measures to get rid of parasites and lessen the amount of meat lost due to parasites.
الخلاصة

البروتينات الإنسان

احتياجات

قدرت

55 جرام 

للبالغين اليوم 

و الرجال 45 جرام 

للبنت

حيث البروتينات الجودة العالية كمصدرو الحيوام تعتبر تتمثل 75 - 80

\( NPU = \) البروتين المنтенاؤه. (وناول البروتينات الجزء الأول من دراسة على

ناتج عيان البروتينات نسبة تقليل على تأثير دراسة هذه تناولت في نتائج

بالية التقريرات التحليل وتم وتم والصدور، الفترة في الدارسة والالة لما 2004 - 2006 م

نتيجة الحيوانية البروتينات نسبة تناثر في الدراسات، واختبارات

المحلية للذبابة غناوة من الدارسة لهذه الازمة المعلومات

أخذ والصدر، الفترة في الدارسة والالة لما 2004 - 2006 م

في الأخرية بعامة مقارنة بالية الدارسة النتائج بالنسبة للكلية الفائدة

نسبة القدارة الفترية في الأبراء 2004 - 2006 م

بالي نسبة الكبد، 3 - 4 - 6 

لبيرة، 50

للسوق و 50 - 60

لبيرة بالي نسبة المادية الخسائر

حاليا يحتوي بالي في الدارسة النتائج 524240 سوداني جنیه.

على القضاء الإجراءات التي تضيء الدارسة من خلال

البروتينات البالية الناتجة خطوة وضع يجب أن ذلك يذكر تغيير دون

الحوم البروتين المنتهاء كمية تقلل 

new-converted
CHAPTER ONE
INTRODUCTION

Meat and meat products are important source of protein and of all B-complex vitamins including thiamin, riboflavin, niacin, biotin, vitamins B_6 and B_{12}, pantothenic acid and flavin. The last two are especially abundant in liver.

Meats are excellent source of some minerals, such as iron, cooper, Zink and manganese.

The amount of meat consumed in different countries varies enormously with social, economic and political influences, religious beliefs and geographical differences. It is very large in meat-producing areas such as Uruguay, Argentina, Australia and New Zealand, at 300 g per day compared with an average of 10g in India and Sirlanka.

Human requirements for protein have been thoroughly investigated over the years (FAD/WHO 1985) and are currently estimated to be 55 per day for adult man and 45g for women (there is higher requirements in various diseases states and conditions of stress). These amounts refer to protein of what is termed "good quality" and highly digestible, otherwise the amount ingested must be increased proportionally to compensate for lower quality and lower digestibility.

The quality of protein is a measure of its ability to satisfy human requirements for amino acids. All proteins, both dietary and tissue proteins, consist of two groups of amino acids-those that must be ingested ready-made, i.e. are essential in the diet, and those that can
be synthesized in the body in adequate amount from the essential amino acids. Eight of the 20 food amino acids are essential for adults and ten for children.

The quality of dietary protein can be measured in various ways (FAD/WHO 1991) but basically it is the ratio of the available amino acids in the food or diet compared with needs. In the earlier literature this was expressed on a percentage scale but the adoption of the S.I. system of nomenclature it is expressed as a ratio. Thus a ratio of 1.0 (100 per cent) mean that the amino acids available from the dietary protein are in the exact proportions needed to satisfy human needs a ratio of 0.5 means that the amount of one (or more) of the essential amino acids percent is only half of that required. If one essential amino acid is completely absent (a circumstance that can occur only experimentally with isolated proteins since any food, let alone a whole diet, consists of a mixture of many proteins) the protein quality would be zero.

There is a popular impression, originating at one time from nutrition text books, that the qualities of proteins from animal sources are greatly superior to those from plant source. This is true only to the extent that many animal sources have Net Protein Utilization, NPU, (a measure of the usefulness of the protein to the body) around 0.75 while that of many, but not all plant foods is 0.5 – 0.6. However, after infancy people consume a wide variety of proteins from different foods and a shortfall in any essential amino acids in one food is usually made good, at least in part, by a relative surplus from another food—thus is termed complementation. As a result the protein of whole diets even in developing countries rarely falls below NPU of 0.7, a
value that can be compared with average of 0.8 in industrialized countries (FAD/WHO 1985).

The value of meat in this respect is that it is relatively concentrated source of protein, of high quality (NPU 0.75 – 0.8), highly digestible, about 0.95 compared with 0.8-0.9 for many plant foods, and it supplies a relative surplus of one essential amino acid, lysine which is in relatively short supply in most cereals (FAD/WHO, 1985).

Negative health outcomes associated with inadequate intake of these nutrient include anemia, poor growth rickets, impaired cogitative performance, blindness neuromuscular deficits and eventually death (Murphy, S.P and Allen, L.H. (2003).

Small livestock have an extremely important role to play in the sustainable and affordable improvement of diet quality of families in less technically developed and poor countries.

The prevalence of parasitic infections responsible for condemnation of carcasses and viscera during meat inspection, and their economic implication, was estimated in a year long abattoir survey of 10277 slaughtered from animals in the region of Trikala, Greese. The organs examined for the presence of parasitic lesions during meat inspection were liver and lungs of all animals, rumen of cattle, small intestine of lambs and kids and muscles of cattle caused only by hadatid cyst. The parasitic lesions observed in the liver of cattle sheep and goats were as a result of hydatid cysts and flukes of *Fasciola hepatica* and *Dacrocodemum dederiticum*, Moniezia sp. Proglotiids were found of parasites responsible for condemnation of
marketable organs was low (0.26%) parasite were responsible for 22% of the total condemned organs. (Theodoropounds et al., 2002).

This study was designed therefore to fulfill the following objectives:

1. To access Monitory losses due to condemnation of meat.
2. The ratio of condemnation due to parasitic causes compared to other causes of condemnation.
3. Analysis of possible causes of disease control measure failure.
CHAPTER II

2.1 LITERATURE REVIEW

Of all types of animals associations, perhaps the term parasitism has been the most difficult to describe. This appears to be largely due to failure to recognize that the term has only relative meaning, it has also been complicated by the insistence of many authors that a parasite must necessarily be harmful to its host (Croften, 1971).

A parasite is thus considered here to be an organism which is not only in continuous, intimate association with another organism, the host (Normally of different species), but also metabolically dependent, directly or indirectly on it to some degree.

Many parasites have living stages in their life cycles and only during the periods when they make contact with their hosts and can they actually be considered to lead a parasitic existence.

Although at first it would appear that parasites are dependant on their hosts for food materials, a closer examination shows that the situation is more complex than this. Examples can be given of parasites which are dependant on their host for one or more of the following:

1. Developmental stimulation.
3. Digestive enzymes.
4. Control of maturation.

2.1 Types of parasites:

Once parasites were classified according to their life cycles, position in or on the host. It was common practice, for example, to speak of ecto-parasites and endoparasites.
Ectoparasites, are organisms (e.g. Fleas, lice, ticks) that live on the external teguments of their hosts. Usually attached to the skin, feathers, hair, gills … etc; such organisms can never lead a completely parasitic existence, but utilize oxygen from outside the host. Many maintain periodic contacts with their hosts and according to the definition given earlier, can not be considered as parasites but essentially special kinds of predators (Smyth, 1962).

Endoparasites live within their hosts, in the gut, body cavity, lungs or other tissues; such forms mostly live a completely parasitic existence. Certain parasites fall into both these grouping. The mite (sacroptes), for example barrows in tannels in the skin and could satisfy the criteria of either an ectoparasite or an endoparasite. These terms cannot always be accurately defined but are convenient general terms.

Parasitologist also speak of:

1. Facultative parasites which can live either a parasitic or free existence.
2. Obligate parasites which live an obligate parasitic existence and are incapable of surviving outside the host environment. In a latter definition the emphasis must be on a "naturally occurring" environment, for many obligated parasites can now be cultures in artificial environments of a complex nature.

2.2 Parasites survival inside the host:

To invade the body of another species of animal, and to live and multiply in or on it, could not have been achieved without considerable morphological, physiological, biochemical and immunological adaptation by the parasite.
The parasite has a complex strategy to insure their survival. They can mimic their host's biochemical reactivity so that they go undetected and slip past normal defenses, they then fool the host into providing protection. They are not affected by vaccine nor do they behave like other diseases. Their life cycle is very complex and their defenses too complete to be treated easily also has amazing ways to move from host to another.

2.3 Types of hosts:
1. Definitive hosts: It is the organism that hosts the adult (sexual) form of the parasite.
2. Intermediate host: It is an organism that hosts the asexual form of parasite (only when there is an obligatory passage through the host).

2.4 Parasite locations:
The most popular sites for intestinal parasites are the duodenum, the ileum; the caecum and the large intestine. The special structural details of these regions, especially affect the biology of parasites. The topography of the alimentary canal-especially with respect to size of villi and width and depth of crypts-undoubtedly plays an important role in determining host specificity of certain species. In rays for example it has been shown that the scoleces of various species of the cestode genus Echeneibothrium are closely adapted to the depths of villi, crypts or reticulations of the mucosa. The mucosa of the vertebrae gut is covered with a film of mucous, even in the fasting animals, and its character varies somewhat in the different regions. In general, it has a viscid surface suitable for the
adhesion of many types of parasites. In autopsy examination of the gut, a tape worm for example, is usually found flattened and stretches with its surface adhering closely to the mucosa. This close adhesion to intestinal mucosa is probably essential to cestodes for absorption of food materials and diffusion of waste materials, as well as being necessary to compress the strobila sufficiently to enable the cirrus in each proglottis to be bent into an adjacent proglottid, thereby permitting insemination and fertilization to take place.

Like the alimentary canal the quality of soluble food materials in the blood stream will vary with the feeding habits of the host. As a source of nutrient, its value must be considered in relation to the morphology or physiology of the organism utilizing it (cestodes), which lacks a gut and is dependent on small molecules of absorbable dimensions, such as amino acids or glucose. It is a relatively poor medium compared with that provided by duodenum. On the other hand, trematodes such as *Schistosoma mansoni* which posses both a gut and a well-developed digestive enzyme system, the quality of protein in the plasma and blood cells represents a diet of potentially high nutritional value in mammalian blood. Apart from protein and the usual inorganic constituents the substances likely to be of physiological importance to a parasite are fat, in the form of natural fats (triglyceride), lecithin and cholesterol, amino acids are determined by the liver. Some pass into the systemic circulation from which they are normally taken up by the tissues to repair protein wear and tear. The resting concentration of amino acids in blood (man) is 3 – 5, g per 100 ml, but many rise to 10mg per 100ml after a protein meal. Glucose in the blood of a fasting animal may rise rapidly after feeding.
to 125 mg per 100 ml, to fall again as it diffuse into the tissues for energy purposes. The concentrations of nutrients in the blood may be influenced by the presence of parasites. Only limited number of parasites are capable of direct utilization of blood protein. The trematode Schistosoma which metabolizes hemoglobin within an erythrocyte are example.

2.4.1 Blood cells:

Two groups of cells are found, red blood cells and white cells (leucocytes). In mammals, three types of white cells occur, lymphocytes, Monocytes and polymorphonuclear granulocytes.

2.4.2 Muscle:

Muscle is not generally a favored site for parasites. This is probably related to the nature of its function, which result in an environment which is liable to change suddenly. Despomire (1976) has given analysis of muscle as an environment for parasites. The most studied parasites of skeletal muscle are probably the protozon Sarcocystis and the encysted stage of the nematode Trichinella spiralis. In addition to containing high level of ATP, muscle cells contain unusual components such as myoglobin myocin, actin, creatine and creatine phosphate. The presence of some substances (e.g. lactic acid) may fluctuate widely depending on the state of concentration of muscle.

2.4.3 Liver:

Protozoan (e.g. coccidians) and several helminthes (especially trematodes and larval cestodes) are the main parasites found in the liver. The organ does not provide a very stable environment for its
chemical composition may fluctuate widely depending on whether the diet is a balanced one, or one rich in proteins, fats or carbohydrates. Ranges for example are fat, 1.6 – 52 per cent; glycogen, 0.07 – 11 per cent; water 35 – 73 per cent of liver mass. It is also rich in accessory growth factors, such as iron or vitamins, and plasma proteins. Its arterial and venous supply is excellent and may be a site of parasites in or near the liver, it may be assumed that as an environment it is particularly favorable, and that many of the stored materials are available for uptake by the parasites. Its pH is in the region of 7.0 with tendency towards acidity. A major function of the liver is to produce bile, which is not only involved in the absorption of lipid by the gut but also serves as an important "trigger" in many parasite life cycles (Smyth, 1962).

2.4.4 Body cavity: (peritoneal cavity).

Many larval heminthes occur in the body cavity of mammals, especially rodents, and other vertebrates, especially fish and amphibian (Smyth, 1962).

2.4.5 Cerebrospinal fluid:

The chemical composition of cerebrospinal fluid some what resemble that of lymph. It is apparently a true secretion and not just a dialysate of blood plasma. It differs from other body fluids in the small protein content, 28mg per 100 ml or approximately 0.3 – 0.5 per cent of blood plasma. There are a corresponding small antibody content, with the result that parasites may be able to persist in the central nervous system after antibodies have eliminated them from other part of the body (e.g. Trypansoma species) (Smyth, 1962).
Parasites are able to travel almost anywhere in soft tissue including the brain, they can form granulomes in lungs, liver, uterus and other organs. They produce toxic metabolic waste that can attack the central nervous system, this can result in restlessness, anxiety and depression.

Parasite can use parts of a host's body to suit their own needs. They can feed on almost anything's; blood, gut lining. Liver, or not and can force their host's body to bring them food. By definition, parasites in some ways always harm their host (Smyth 1962).

2.5 Parasitic Disease spread:-

Infection may be transmitted by various routes depending on the nature of both parasite and host.

a) Infection by passive entry: by feeding and drinking (e.g. Taenias).

b. By direct contact such as sexual intercourse (e.g. *Trypanosoma equinum*).

c. Active entry: By biting (e.g. Gossina species) = the transmission either mechanical or biological.

d. By highly specialized developmental from in life cycle of the parasite (e.g. *Schistosomas cercaria* activity penetrate skin) (Opperdies, 2000).

2.6 Effects of parasites on the host:

Parasites represent one of the most diverse group of the organisms that live on the host (ectoparasites) or within a host (endoparasites)
They are responsible for undereds of insidious diseases ranging from enteric diseases to vector-born hemoparasitic infections.

Livestock and poultry industries are severely affected by significant losses in animal production due to weight loss, anemia, diarrhea and death. The following are examples of such effects:

1. *Diphyllobothrium latum* compete with the host for food especially vitamin B\textsubscript{12} where the host suffers specific deficiency syndrome.
2. Reduce appetite.
3. Decrease synthesis of protein in skeletal muscle.
4. Change in the absorptive surface of the intestine may result in marked alteration in the efflux and enflux of H\textsubscript{2}O and NaCl.
5. Removal of the host's tissue and fluid by parasite by blood sucking activity of certain nematodes and arthropods taking *Haemonchus contortus* as example; when reaching abomasums, it undergoes the third and fourth molts and reaching maturity. Many thousands of worms may occur in a single ruminant stomach, and has been estimated that 4000 worms suck about cm\textsuperscript{3} of blood per day. Medium infections cause sheep and cattle to loose condition and heavy infections may cause death (J.D. Smyth 1994).
6. Tissue destruction during migration by pressure (hydatid) or blocking the duct (Strongylous) lead to infection or oedema and elephantiasis (Filariasis) or necrosis and rupture of intestinal canal (Ascardia).
7. Lead to secondary infection (*Fasciola heptica*).
The end result of parasitism is anemia, emaciation or paralysis.

Other effects on the host immune system such as:

1. Parasites exert immunosuppressive, antigenic and mitogenic undigested protein in food to get into the food, causing further activation of the cells because they try fight this protein which weakens the immune system. Parasites and associated intestinal damage cause mal-absorption and resulting malnutrition further weakening the body and the immune system (Pearce, 1997).

2. Blood parasites e.g. *Theileria parva* once injected into the cow's blood stream it invades the animals white blood cells, causing them to divide uncontrollably. The multiplying cells clog the cow's organs killing the animal within 2 – 4 weeks.

3. Impaired resistance to infection, through the impairment of the cell-mediated immune (CMI) system and the decreased bactericidal function of white blood cells, occur most commonly with Zink, iron and vitamin A deficiencies. The MCI is the body's first line of defense against viral, fungal and certain bacteria (Neumann *et al.*, 1998).

### 2.7 Economic of parasitic disease:

Livestock is an important element of the pathway out of poverty for millions of the rural poor in the world.

Livestock has special role in the conversion of feed that is suitable for human in food and other useful products. Small livestock especially goats, sheep, pigs and poultry are especially important for the poorest livestock keepers.
Although parasites that affect livestock are rarely associated with high mortality, parasitic disease continue to be a major constraint on profitable livestock systems.

The importance of ticks and ticks born diseases, gastrointestinal parasites, trypanosomiasis, flies-mites and lice has been recognized for many years. (FAO, Animal Production and Health Division, 2006). Echinococcosis is azoonotic disease that occurs throughout the world and cause economic losses and public health problems in many countries. Domestic intermediate hosts (cattle, sheep and goats) are major reservoirs for the disease tp human. Infection of humans occurs during the natural transmission of the parasite between the canied definitive host and domestic livestock intermediate hosts. In addition large hydatid cysts in the liver and lungs of sheep and cattle can result in significant economic loss to meat industry through condemnation of the infected organs (Pumpeks et al., 2005).

Researchers reported that the commonest cause of condemnation were echinococcosis, cysticercosis and fasciolosis. The affected organs were liver, lungs and heart (Kaloganov et al., 1989).

Also (Githigia et al., 1995) reported that hydated cysts were the major helminth parasite causing condemnation of liver, lungs and intestines the also mentioned Stilesia hepatica as one of the major reasons for liver condemnation and pimply gut as a reason for condemnation of intestines.

2.8 Diagnosis:

Diagnosis of parasitic infections still depends heavily on parasitological findings, e.g. parasites in blood smears or biopsies and eggs or cysts in fecal samples. Although these tests, if successful,
provide unequivocal evidence of infection they are limited, especially when applied to low-level infections or to infections where the parasite occurs in deeper tissues.

Immunological diagnostic tests have a valuable role to play, not only for these more difficult situations, but also in large-scale examinations of populations in endemic areas.

Many immunologically based tests have been used in the past, some with a great deal of success, but the provision of appropriate antigens and achievement of sufficient sensitivity and specificity, have created considerable problems. Advances in knowledge of parasite antigens, and the ability to synthesize and clone suitable molecules, have considerably improved the situation. It is possible now to select antigens that are known to have high specificity, and to use these in a variety of sensitive tests, of which the enzyme-linked immunosorbent assay (ELISA) and its derivatives are among the most widely used. ELISA tests can be used to measure antibody responses to defined antigens, and the pattern and level of isotype response can be used to provide an accurate picture of the patient's experience of function, not merely to show that there have been some exposure at some time in the past. ELISA can also be used to detect the presence of parasite antigens in body fluids or in fecal materials. This provide quantities data on the level of infection present. The efficiency of ELISA and many other immunological diagnostic tests has been enhanced by availability of monoclonal antibody reagents, which give a greater specificity and allow a greater degree of quality control, giving better reproducibly. ELISA testing is amenable to automation and also for
rapid colorimetric applications which required minimal expertise, such as ‘dip-stick’ tests.

Specific diagnosis is improved by being able to show precisely which antigens are recognized by a patient's serum.

Immuno-blotting tests, in which parasite antigens are separated and transferred into cellulose paper before reaction with sera, make it possible to see patterns of antigen recognition.

Prepared paper can be used under field conditions, either to obtain this kind of detailed information or simply to see whether there are any antibodies present against un-separated parasite antigens (the dot-blot test) (Smyth, 1994).

2.8.1 Diagnostic procedures:

Parasites inhabiting the digestive canal and biliary and urinary system produce eggs, larvae or cysts that leave the body of the host by way of feces or urine, occasionally even adult parasites may be seen in feces especially when the host has enteritis.

Parasitic worm eggs or larvae from the lower respiratory system are usually coughed into the pharynx and swallowed, and they too appear in feces. Many parasitic form seen in feces have characteristic morphology that is diagnostic for a particular species of parasites. On the other hand, certain worm parasites produce eggs that may be recognized as those nematodes, flukes or tape worms but can not easily be separated as to the exact species of origin.

The majority of internal parasites are diagnosed by microscopic examination of the feces for eggs.
In some parasite diagnosis is made by observation of the mature parasite in feces especially in tape worms, because its eggs are difficult to detect during microscopic fecal analysis.

The primary methods for fecal analysis are direct observation of fecal samples. Indirect observation smears are made of some fecal material on a microscope slide and analyzed for parasites eggs. Its used to detect eggs that do not show up well during direct fecal examination.

In fecal flotation a sample of fresh feces is put into special solution that cause any eggs that might be present to float to the top and adhere to cover slip.

2.8.2 Blood parasites:
Protozoa:

Most of the protozoan parasite that invade blood are destructive to erythrocytes. Hence when patient show clinical symptoms of anemia, then blood should be examined for hemoglobin content and for cellular number. Carefully prepared blood films should then be examined for presence of erythrocytes having abnormal size, shape and poor staining reaction. Also the cells and the plasma should be searched for evidence of parasites.

2.8.3 Nematode larvae:

Many species of parasitic worms enter the blood stream of the host in order to reach certain organs or tissues where they develop to maturity. Their stay in the blood is usually only for minutes or hours hence they are seldom seen in blood specimens taken for diagnostic purpose.
However, there is a group of related nematodes (Filariids) whose larvae (microfilariae), are, of necessity, found in circulation. Here they wait for the arrival of their blood sucking intermediate hosts, in which they must undergo further development to an inoculative stage. These intermediate hosts are blood-sucking insects.

**Procedure:-**

1. Direct examination of the whole blood for the detection of nematode larvae, by putting a drop of blood from the vein in a clean microslide and put cover and see the motility (× 100).

2. Using Giemsa's stain is the most useful method.

**2.9 Control parasitic Diseases:**

A good access to information on disease control and livestock management to decide where and how to invest the available resources in order to increase animal production.

In view of need of an effective and sustainable parasite control in livestock system throughout the world, it is clear that control of parasitic disease needs to move always from the reliance on anti-parasitic compounds to a more integrated and sustainable method from diagnosis, preventive measures and control.

Parasite control starts with good knowledge of the parasites and how they affect livestock.

Control of internal parasites depends basically on the environmental sanitation, treatment and vaccination.

**2.9.1 Environmental sanitation:**

As prevention, animals should not be allowed to graze when pasture is wet young animals should preferably be put in new pastures
where parasite levels are low. Manure should be composted and soil drainage improved where needed. These achieved by:

(A) Pasture management: by varying such factors as the density and age groups of animals and the time and intensity of grazing that serious infections can be avoided (Antoine, D. 1981)

(B) Grazing height: about 80% of parasite live in the first five centimeters of vegetation-parasite infection and multiplication are prevented by letting animals graze only 10 cm from the ground (Jones, 1993).

(C) Grazing time: The drier the grass the more parasite will stay at the base of the plants, it is estimated that in wet grass, larvae can be found over 30 cm away from the pats, where as they venture only few centimeters away when the grass is dry. The risk of infection is greatly lowered by waiting until the dew has lifted or until the grass has dried after rain. Before butting animals out to pasture also limiting grazing time until when the sun is strong also diminishes the risk of infection.

The density of L₃ larvae is generally at maximum in the fall and at minimum in the summer, it is preferable to limit grazing in highly contaminated filed to the summer months to reduce the level of ingestion. In fall animals are put in new pasture.

(D) Grazing by age group: since susceptibility of animals varies with age, it is logical to graze the young animals in field where parasite population are very low.
Soil management: Deworming treatments have a little effect if the animals are returned to the same larvae-infested field. It is therefore important to clean the pasture as much as possible to reduce, if not eliminate, the parasites. This is achieved by resting the land, planting using amendments or fertilizers to reduce parasite population.

1. **Planting**: by using nematicide plants e.g. Mustard.

2. **Amendment** which is inappropriate for parasites e.g. salt (NaCl) against Ancylostoma larvae.

Limiting and acidification with copper sulphate against Fasciola (Nunnery, 1953).

**2.9.2 Treatment:**

By using dewormers, but it is only a short-term solution. Animals that graze are always exposed to parasites and are thus constantly being re-infected; not to mention that routine deworming treatments delay the development of immunity in young animals. Moreover, certain parasites have developed a resistance to such deworming products as Bensimidazole, levamisole, and even Ivermectin because of too frequent use.

Studies in New Zealand and Ireland indicate among other things that deworming slow the decomposition of manure so deworming treatments should therefore only be employed in emergency situations or, if using weaker products as preventive maintenance.

Deworming can be done when the animals are put out to pasture and again three weeks later (Jean Duval 1994).
Drug resistance: Drug resistance has emerged as the single most important problem confirming the control of parasites in livestock worldwide. The use of drugs continue to be the primary treatment against parasites but the use of these products has resulted in resistance to the majority of intensively drugs currently available. A survey co-jointly conducted by the Food and Agricultural Organization (FAO) of United Nation and World Animal Health Organization and (OIE) determined that more than 20% of the countries surveyed reported problems with drugs resistant parasites.

Helminthic disease of cattle and sheep are increasing due to the ever-increasing incidence of drugs resistance in parasitic nematodes.

Developing control measures against nematodes will require knowledge of the species composition and the ability to differentiate closely related helminthes. Selective pressure on parasitic populations (e.g. drugs, climate change), and wild life host introductions will continue to alter the composition of parasites on pastured cattle and sheep. To differentiate these parasites will be critical to managing and controlling parasitic disease in the face of increased drug-resistance.

2.9.3 Vaccination:

In recent years there has been considerable progress towards the development of effective anti-parasite vaccines and the achievement of improved diagnosis. This progress has been made possibly by a greater understanding of the nature of immune responses to parasitic infections, but has depended heavily upon technical advances in the identification, isolation and production of antigens. The approaches of molecular biology have been particularly important in allowing determination of antigen structure and identification of coding genes.
this making it possible to produce synthetic and recombinant antigens. However, these techniques by themselves would have been less fruitful has not gone hand-in-hand with improvement in the ability to pin antigens and epitopes of major importance in immune responses.

Relatively few vaccines are currently in commercial production, and these are the irradiated larval vaccine against the lung worm *Dictyocaulus viviparous* in cattle has the longest history of success in the field (Poynter *et al.*, 1960). Vaccination depends upon administration of irradiated infective third stage larvae, which initiate, but do not complete, worm provide the antigenic stimulus necessary for the development of protective immunity, but die before maturity into the adult stages responsible for the pathology of the disease. This is an excellent example of an empirical vaccine, in which neither the antigen nor the immune response necessary for immunity are known. Many attempts to produce similar vaccines, by using irradiated stages, have either failed to achieve significant immunity under filed condition or have suffered from drawbacks that have reduced their success. Of the latter, the commercial failure of the irradiated karvae vaccine against cannie hook worm is perhaps the best known (Miller, 1978). The vaccine protected well against the disease associated with infection, but did not give complete protection against infection itself, allowing low-level worm bundens to develop.

Gastrointestinal nematodes: the early success of the irradiated vaccine used against lung worm raised hopes that similar vaccine would be effective against the *Trichostrongly* species responsible for gastrointestinal infections in cattle and sheep. Although effective vaccination has been described under controlled conditions, attenuated
vaccines have not been successful under field conditions. A number of programmes are now using defined and recombinant antigens as the basis of vaccines, principally targeted at the important parasites of sheep, such as *Haemonchus contortus* and *Trichostronglus colubriformis*. Significant progress has been made using molecules expressed at the surface of the worm's intestinal cells as the vaccine antigen. These cryptic antigens raise very little immune response in natural infections, but sheep immunized against them allow high levels of immunity against subsequent challenges. Vaccination has been achieved successfully using both parasite derived and recombinant molecules, and has been found to be effective even in comparatively young lambs (Smith, 1962).

**2.9.3.1 Vaccination against Blood Parasite:**

Vaccines against babesiosis and theileriosis have been developed successfully, but both depend up on the use of attenuated organisms (Morrison, 1980). Although provisions of parasites is not necessarily an insuperable obstacle in all cases, as these vaccines shown, the difficulties of obtaining sufficient parasite materials, either for production of attenuated stages or for development of vaccine against other infections. Equally, although it is acceptable to use live vaccine in animals, there are major ethical constraints on their use in human. In general, vaccine research is currently focused almost exclusively on the use of recombinant or synthetic antigen.

Control of Blood Parasite:

In general by following these steps:

1. Vector control.
2. Chemoprophylaxis.
4. Vaccination.

1. Vector control

Methods for vector control can be divided into two groups of measures:

a) In the habitat of the animal when the vector is either at rest or developing.

b) On the target animal while the vector is feeding, developing or resting.

a. Control methods in the habitat of animal:

Its aim is to destroy the habitat of the vector or to alter it in such away that its resting stage is disturbed or its development prevented. Management measures may also make the contact between vector and host more difficult and prevent the vector from feeding. These are achieved by:

1. Pasture management.
2. Fly traps.
3. Targets.
5. Biological Measures.
6. Vector control on animal:

Vector may be destroyed on the host animal while feeding, or during development. This depends on their mode of development and whether they feed only temporarily or permanently on blood. The compounds which are applied must have a toxicity level which is harmless to the animal while being efficient against the vector (Seifert Horsts, 1996).
CHAPTER THREE
MATERIAL AND METHODS

3.1 Data collection site:

Data and information about condemnations was taken from Ghanawa Slaughter house.

Ghanawa Slaughter house is rated as first grade facility which occupies an area of about 620 feddans in West Omdurman in the vicinity of Almewlih, the country's main livestock market. It has a good drainage, but condemned parts are burnt in an open area around the slaughter house as there is no incinerator. Animals slaughtered for local consumption at this slaughter house range between 250 – 300 cattle and 15 to 20 sheep per day inspected. The number of animals included during the course of this study was 171786 cattle and 1665 sheep belonging to different breeds and age groups. Animals are usually slaughtered early in the morning. The study was carried in 2006 but figures for slaughter during 2004 – 2006 were included.

3.2 Slaughtered Animals:

The estimated age of slaughtered animals during the study ranged between 8munthes to 1year for sheep, but as for cattle no definite age was recorded, all animals were slaughtered after exclusion of producing cows.

3.3 Judgment at meat inspection:

Qualified veterinarians perform meat inspection. Judgment of the slaughtered animals infected with parasite is made according to the meat inspection law of Khartoum State (Appendix I). The results were recorded soon after the inspection was completed.
Inception for parasite is accomplished by making incisions in the predilection sites and visually inspecting for the presence of parasites. Inspection sites include heart, liver, lung, muscles. The presence of a cyst in more than one of these organs is taken as an indicator for generalized infection in which the whole carcasses is checked.

3.3.1 Slaughter house records:
Secondary data and information about the condemnation of animal parts in Ghanawa was obtained from the official records, for the period 2004 – 2006 from the department of slaughter houses, Ministry of Agriculture, Animal Resources and Irrigation Khartoum State. Record sheets have been used for this purpose and are designed to contain data and information regarding total numbers of slaughter animals including the allocation of information regarding the total condemnation of all animals categorized by species (sheep, goat and Cattle) and the causes of condemnation.

3.4 Average Prices:
Different prices were estimated for the different part that are lost. Due to condemnation, cattle liver weighing about 5 - 6 kilograms, cost 16 Sudanese pounds for one kilogram, rumen and small intensive are bought together weighing 2 kilograms cost about 10 Sudanese pounds and sheep liver that weigh half kilogram cost 8 Sudanese pounds.

3.5 Data analysis and Presentation:
Analysis pertaining to condemnation due to parasitic infestation was performed to elucidate the occurrence of the parasite, the rate of
parasitic infections causing condemnation and frequency distribution of the various causes of parasitic diseases.

Also costing of condemned livers was estimated according to average prices for this organ as an indictor of monitory loss due to condemnation.
CHAPTER FOUR
RESULTS

4.1 Condemnation at post mortem:
Out of 171786 cattle and 1665 sheep during the period of study 2004-2006. The incidence of condemnation due to different causes: liver= 4157, lung= 395, heart= 21, head= 3, intestine= 4, forelimb= 0 and carcass= 12, these due to parasitic causes, as for non parasitic causes: liver= 2396, lung= 7751, heart= 374, head=304, intestine= 4, forelimb= 100 and carcass= 15 (Table 1).

It was found that: liver = 17, due to parasitic causes and 52 to non parasitic causes in sheep.

4.2 Condemnation due to parasitic causes:
Parasite infestation that cause condemnation in cattle was: fasciola= 2000 (48%), C. bovis= 1171 (28.15%), hydatid= 222 (5.3%) in different organs as shown in table (2) illustrate the different kinds of parasite that are found commonly.

4.2.1 Liver:
Cattle and sheep liver condemnations is more frequent than the other organs due to parasite infection, the actual causes of liver condemnation were found that was due to parasite infection such as factionaries C. bovis, hydrated and schistosoma.
Table (1): Partial condemnation due to parasitic and non parasitic cause in cattle.

<table>
<thead>
<tr>
<th>Organ</th>
<th>Total condemnation</th>
<th>Parasitic cause</th>
<th>Non parasitic cause</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Number</td>
<td>Rate (%)</td>
</tr>
<tr>
<td>Liver</td>
<td>6553</td>
<td>4157</td>
<td>63</td>
</tr>
<tr>
<td>Lung</td>
<td>8146</td>
<td>395</td>
<td>5</td>
</tr>
<tr>
<td>Head</td>
<td>307</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Heart</td>
<td>8</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>Carcass</td>
<td>27</td>
<td>12</td>
<td>44</td>
</tr>
</tbody>
</table>
Table (2): Partial condemnation caused by different parasites in cattle.

<table>
<thead>
<tr>
<th>Organ</th>
<th>Fasciola</th>
<th>C. bovis</th>
<th>Hydatid</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Number</td>
<td>Number</td>
<td>Number</td>
</tr>
<tr>
<td></td>
<td>Rate (%)</td>
<td>Rate (%)</td>
<td>Rate (%)</td>
<td></td>
</tr>
<tr>
<td>Liver</td>
<td>2000</td>
<td>1125</td>
<td>31</td>
<td>4157</td>
</tr>
<tr>
<td>Lung</td>
<td>-</td>
<td>2</td>
<td>191</td>
<td>395</td>
</tr>
<tr>
<td>Head</td>
<td>-</td>
<td>13</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Heart</td>
<td>-</td>
<td>19</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Carcass</td>
<td>-</td>
<td>12</td>
<td>-</td>
<td>12</td>
</tr>
</tbody>
</table>
Table (3): Ratio of parasitic cause to total cause of condemnations in cattle.

<table>
<thead>
<tr>
<th></th>
<th>Total condemnation (T.C)</th>
<th>Parasitic causes (P.C)</th>
<th>P.C T.C (%)</th>
<th>Total condemnation (T.C)</th>
<th>Parasitic causes (P.C)</th>
<th>P.C T.C (%)</th>
<th>Total condemnation (T.C)</th>
<th>Parasitic causes (P.C)</th>
<th>P.C T.C (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver</td>
<td>1170</td>
<td>756</td>
<td>64</td>
<td>2266</td>
<td>1350</td>
<td>59</td>
<td>3117</td>
<td>2051</td>
<td>6</td>
</tr>
<tr>
<td>Lung</td>
<td>1974</td>
<td>60</td>
<td>3</td>
<td>3115</td>
<td>131</td>
<td>4</td>
<td>3057</td>
<td>204</td>
<td>6</td>
</tr>
<tr>
<td>Head</td>
<td>12</td>
<td>3</td>
<td>25</td>
<td>221</td>
<td>10</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Offal's</td>
<td>4</td>
<td>2</td>
<td>50</td>
<td>2</td>
<td>1</td>
<td>50</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Carcass</td>
<td>4</td>
<td>2</td>
<td>50</td>
<td>6</td>
<td>4</td>
<td>66</td>
<td>17</td>
<td>6</td>
<td>35.2</td>
</tr>
</tbody>
</table>
CHAPTER FIVE
DISCUSSION

The central role of animal source foods in providing high quality (NPU 0.75-0.8), and readily highly digestible protein, about 0.95. Compared with 0.8-0.9 for many plant foods, and it supplies a relative surplus of one essential amino acid, lysine which is relatively short supplies by most cereals.

There is a steadily increasing demand for meet in the developing countries so that there is to be significant increase in meat production it will require clear policy decisions with the necessary financial, legislative and technical support.

There is considerable potential for increasing supplies through better management, selection of animals.

This study reveals the prevailing causes of partial and total condemnation due to parasite in slaughter houses (taking Ghanawa as example) lead to loss of considerable amount of meat.

It would seem that this would be an easy problem to find and treat, but just the opposite is true. Parasites come in all shapes, sizes and stages of development, and very hard to diagnose, in addition of that the failure in control measures.

During 2004-2006, it was found that 6 carcasses, 4157 liver, 395 lung, 21 heart, and 4 intestine out of 165786 cattle slaughtered at Ghanawa slaughterhouse were condemned.
Estimation of the financial losses due to these condemnations, amounted to about 99744 Sudanese pounds annually for liver only according to the present value (2007). So when comparing the losses resulting from carcasses and the other parts condemnation it will make significant amount of money.

It was found that liver was more frequently condemned than others due to parasite such as fascioliasis 48%, C. bovis 27%, hydatidosis, and to a lesser extend schistosomiasis. Similar results were found by Kaloganov et al. (1989) and Pumpeks et al. (2005) in Turkey.

Liver condemnation due to fasciolasis during this period of study 2004-2006, are 2000 (48%). It is obvious that there no much change in the rate, that means no actual control measures were done to minimize these losses. Control measures can minimize liver losses due to fasciolasis to great extent, include the intermediate host (Snail) control which can be accomplished by use of molluscicides, biological control by introduction of predators and drying of unwanted water. The control measures also include the regular use of anthelmentics, thus leading to reduction of pasture condemnation and removal of fluke population.

So bearing in mind the financial losses due to liver condemnations and body losses already stated, it become very important to initiate a program for fasciolasis control especially in endemic areas.

Cysticercus bovis, which is the cystic stage of the human tape worm, Taenia saginata, cause 27% of liver condemnation as shown in table (2). There is risk of infection in human on eating raw or improperly cooked beef. This rate indicate that there is high incidence
of cysticercosis in cattle. The epidemiology of this parasite is greatly related to human behavior. Control measures must be applied throughout the year, with especial attention to unlawful slaughtering control.

Condemnations due to hydatidosis or watery cyst represent 0.7% of liver condemnation. Hydatidosis is an important public health problem. Control of this parasite is related to the system of keeping and feeding of dogs, also prevention of unlawful slaughtering.

This study did not reveal high rates of liver condemnation due to schistosomiasis, because some of the condemned livers were judged as being due to non-specific causes. Moreover, schistosomiasis need trained inspectors and laboratory techniques to identify it during post-mortem.

It was found that 2396 of livers were condemned due to pathological changes as shown in table (1), no further investigations about the real cause that leads to these changes were made, some of might be due to parasite. The identification of the real causes is very important to lay down a strategy for control measures. There must be laboratory investigation facilities, preferably in the slaughter houses, to aid in the identification, of real causes of condemnation to insure accurate measures.

It was found that the condemnation. of carcasses represent 03%, heart 0.5%, head 0.3% due to C. bovis, and lung 0.05% due to C. bovis and 40.6% due to hydatid cyst, as shown in table (2).

C. bovis and hydatid cyst represent the most common cause of condemnations as they are the predilection site of these two parasites.
Although this study did not reveal high numbers of other parts of animal condemnations due to parasite, but when put in mind that these parts are essential and basic food for large section of population we understood the importance of insuring healthy animals.

The incidence of parasite infestation in sheep is less than cattle, because they are slaughtered in small ages that did not develop the stages of parasite, just the opposite occur in cattle as they slaughter at older ages.

The data used in the analysis of condemnation due to parasite were only a sample of all possible data. This data were obtained after much effort in retrieval and editing.

The information obtained from the governmental record is inadequate because almost all the records collected from different abattoirs for local and export slaughter mention only the number of the parts condemned without the cause, only Ghanawa abattoirs for local slaughter has organized records.

The incidence of parasitic infections at slaughtered animals are remarkable and has considerable number specially the liver and although the condemned head, viscera are rare but when found they were because of parasite. Although there is a well equipped lab, the judgment based on visual examination only.

There is a steadily increasing demand for meat in developing countries because no other substitutes are available such as developed countries, so they benefit of every part of the animal to cover their needs. To achieve this we had to insure healthy animals by using the best methods to minimize losses.
RECOMMENDATIONS

* A well equipped lab with efficient staff to undertake accurate examination of meat.

* Meat hygiene and safety education should be extended to animal owners, slaughter house workers, and to all those who are involved in meat handling.

* Activation and implementation of regulation and standard in meat inspection.
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APPENDIX (1)


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(7) ﻛﺩ ﺍﻟﻔﻭﺭ ﻋﻠﻰ ﻉﺭ ﻭﺍﻟﻠﺤﻭﻡ ﺯﺍﻭﻨﺎً ﻋﻠﻰ ﺍﻟﻔﺤﻭﺼﺎﺕ ﺍﻟﻤﻨﻊ ﺍﻟﺨﺎﺼﺔ ﺍﻟﻌﺎﻤﻠﻴﺔ ﻭﺍﻟﻤﻌﺩﺍﺕ ﺍﻟﻤﺒﺎﻨﻲ ﺍﻟﻤوهاز ﻋﻠﻰ ﺍﻟﺤﻴﻭﺍﻥ ﺃﺫﺒﺤﻪ ﺃﺯﺯ ﻋﻠﻰ ﺍﻟﻔﻭﺭ ﻋﻠﻰ ﺍﻟﻔﺤﻭﺼﺎﺕ ﺍﻟﻤﻨﻊ ﺍﻟﺨﺎﺼﺔ ﺍﻟﻌﺎﻤﻠﻴﺔ ﻭﺍﻟﻤﻌﺩﺍﺕ ﺍﻟﻤﺒﺎﻨﻲ ﺍﻟﻤوهاز ﻋﻠﻰ ﺍﻟﺤﻴﻭﺍﻥ ﺃﺫﺒﺤﻪ ٧٢٠ ﻣ. ﻭﺍﻟﺨﺎﺼﺔ ﺍﻟﻌﺎﻤﻠﻴﺔ ﻭﺍﻟﻤﻌﺩﺍﺕ ﺍﻟﻤﺒﺎﻨﻲ ﺍﻟﻤوهاز ﻋﻠﻰ ﺍﻟﺤﻴﻭﺍﻥ ﺃﺫﺒﺤﻪ ٨٠٠ ﻣ. ﻭﺍﻟﺨﺎﺼﺔ ﺍﻟﻌﺎﻤﻠﻴﺔ ﻭﺍﻟﻤﻌﺩﺍﺕ ﺍﻟﻤﺒﺎﻨﻲ ﺍﻟﻤوهاز ﻋﻠﻰ ﺍﻟﺤﻴﻭﺍﻥ ﺃﺫﺒﺤﻪ ٨٢٠ ﻣ. ﻭﺍﻟﺨﺎﺼﺔ ﺍﻟﻌﺎﻤﻠﻴﺔ ﻭﺍﻟﻤﻌﺩﺍﺕ ﺍﻟﻤﺒﺎﻨﻲ ﺍﻟﻤوهاز ﻋﻠﻰ ﺍﻟﺤﻴﻭﺍﻥ ﺃﺫﺒﺤﻪ ٨٤٠ ﻣ. ﻭﺍﻟﺨﺎﺼﺔ ﺍﻟﻌﺎﻤﻠﻴﺔ ﻭﺍﻟﻤﻌﺩﺍﺕ ﺍﻟﻤﺒﺎﻨﻲ ﺍﻟﻤوهاز ﻋﻠﻰ ﺍﻟﺤﻴﻭﺍﻥ ﺃﺫﺒﺤﻪ ٨٦٠ ﻣ. ﻭﺍﻟﺨﺎﺼﺔ ﺍﻟﻌﺎﻤﻠﻴﺔ ﻭﺍﻟﻤﻌﺩﺍﺕ ﺍﻟﻤﺒﺎﻥ
لا يمكنني قراءة النص العربي بشكل طبيعي.
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: تأكد من تكوين الفعل "حاسوب" وتكملة النحو (W)

: تأكد من تكوين الفعل "บำรج" وتكملة النحو (7)

: قربًا من الموقع (8)

: تأكد من تكوين الفعل "تجميع" وتكملة النحو (D)

Kūdorj أدلعأمس الشارع (أ) على قرب pH في الإستعداد على 2 ألعاب أ.ن (1)

: تأكد من تكوين الفعل "تطبيق" وتكملة النحو (2)

: تأكد من تكوين الفعل "تطبيق" وتكملة النحو (10)

LD جودشيس فكت لمحAttribute (11)

: Tиф (12)

- : تأكد من تكوين الفعل "تطبيق" وتكملة النحو (12)

: Tиф (13)

: قربًا من الموقع (14)

: تأكد من تكوين الفعل "تطبيق" وتكملة النحو (15)

- : Tиф (16)

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لا يوجد نص يمكن قراءته بشكل طبيعي من الصورة المقدمة.
- :أب اله ف ء ازغذ أ زف أسومج تودع أ ؤسأ ة- 12

:نوك ازغذ أ هي أ سأ زف أ نرق ع ترق أ سأ ترق أ

:و أتقلب و أقلب و أحشرة أذبحة فحص يتم أ

:أول أ ؤسة و أقل و ألب و ألب أاقل يدح أسماح

:أ نفم أ عضلات أ بلم أ انفم أ غزود أ أتدع أ

:صص أ رأس أ حبوب أ الفم أ نفم أ معيتته تتم أ

:أ لثة أ ألسنة أ خارجية أ الداخليه أ الأصطغ الرأس

:أ تفحص أ و أغلق أ الأمعاء أ الكرش :ضرورا عند أ تعم أ

:أ القصبة أ نمرأ يقصل فحص و يتم أ الهواءية أ

:أ الطحال :أ ضروراي يعاني عند أ بالف جف يفتح أ

:أ القصبة أ غير :أ ضرورا أ يعاني أ

:أ الكبد :أ الليمفاوية أ الكبد أ غزود أ أضيأ أ أضح أ

:أ الرئة :أ اضلاعلا :أ يعاني :أ

:أ العضلة أ كلا :أ يعاني :أ

:أ القصبة أ غير :أ ضرورا :أ يعاني أ

:أ القلب :أ متحرك للطعام أ البطن أ جهة أ

:أ العضلة أ جلود أ أضح أ

:أ اللثة :أ سنا :أ خارجية :أ الداخليه أ الأصطغ الرأس

:أ يفسح أ و أغلق أ الأمعاء أ الكبد :أ

:أ الرئة :أ

:أ العضلة أ كلا :أ يعاني أ

:أ القصبة أ غير :أ ضرورا :أ يعاني أ

:أ القلب :أ متحرك للطعام أ البطن أ جهة أ

:أ العضلة أ جلود أ أضح أ

:أ الرئة :أ

:أ العضلة أ كلا :أ يعاني أ

:أ القصبة أ غير :أ ضرورا :أ يعاني أ

:أ القلب :أ متحرك للطعام أ البطن أ جهة أ

:أ العضلة أ جلود أ أضح أ

:أ الرئة :أ

:أ العضلة أ كلا :أ يعاني أ

:أ القصبة أ غير :أ ضرورا :أ يعاني أ

:أ القلب :أ متحرك للطعام أ البطن أ جهة أ

:أ العضلة أ جلود أ أضح أ

:أ الرئة :أ
楼上 / لاعبًا لكيك و طباعًا / حاسوب و جهد و ضغط و إصدار و أتفاق و تدفق و اختبار و تدفق و نشر / أعراض و تدفق و نشر

- كأlest + في / الاستنفاد + حالي + فحص

2. وَبِذِكْرِ 2 أَمْرِاً صَفِّيًّا، لِئَلَّا أَخْفَى سَهْدَةَ الْأَرْضِ مِنَ الْأَمْرِ وَعَرْضَةَ الْأَرْضِ ۖ (١) فَوَأَمْرَةُ ۖ ثُمَّ أَكْلٌ ذِكْرِيًّا ۖ وَلَّا يَأْخُذَ الْأَمْرُ عَلَى الْأَمْرِ ۖ وَلَا يَأْخُذَ الْأَمْرُ عَلَى الْأَمْرِ. (١)

(٢) أَفْلَى وَاكْتُلَبَ الْأَمْرُ عَلَى الْأَمْرِ. (٢)
いただける残り
それに影響を
与えたものを
を一定
cまたはc
を承認した
もしくは

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:-: Después de la muerte del animal, OSK se realiza el levantamiento por el LKLD, n°: 18. 

1. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

2. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

3. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

4. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

5. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

6. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

7. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

8. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

9. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

10. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

11. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

12. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

13. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

14. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

15. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

16. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

17. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

18. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

19. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

20. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

21. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

22. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

23. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

24. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

25. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

26. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

27. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

28. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

29. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

30. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

31. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

32. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

33. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

34. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

35. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

36. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

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40. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

41. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

42. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

43. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

44. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

45. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

46. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

47. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

48. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

49. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18. 

50. Cuando el animal muere, OSK se realiza el levantamiento por el LKLD, n°: 18.
لا يمكنني قراءة النص العربي بشكل طبيعي.
في تلفاة أو تلوث، تمنع البيئة الحالية السالمة التخزين. يجب كنماذج تلوثها، تتسبب معها أخرى مواد وليست وخصائص مناسبة. المبردات أو مخازن تلك تكون أن. ب (يجب) الحيوانات التطفئة السهلة المخازن تلك تكون أنها.

تمكن قلعة تفريز ما هو مرشد على المواد الصحة وفرة التخزين حرارة ودرجة الحيوانات التخزين يمكن أن يشبه من تدعيمها كفاءة التشريفات الغذائية. المتاحة للفتيان وقياسات للمواد والقياسات المعنية.

المنصرة إلى JT المصدرين لل обслужاء غير الرسمية أو الرسمية الحكومة بإتباع sửaات سيارة أو تعيينات بالتغيير في الأعراض عبر توصير الوباء في الأسر والبيئات المحيطة واقتصادية.}

1- الفحصية الحمية مرض.
2- انتشار السائل.
3- الترقية الدموية التسمم مرض.
4- البقرية الطاعون مرض.
5- الهضمية والتصدري التسمم مرض.
6- انتشار الكاذب.
7- حمية البقرة.
8- تنايني مريض.
9- السرية للحبل الحادة العدوى.
10- باحثة المشبوحة جون مريض.
11- الحماية المشبوحة الجذرة مريض.
12- الحيوانات الحزينة.
13- الحماية المشبوحة الحماية المشبوحة القلاعية الحمية مريض.
14- باحثة المشبوحة.
15- الحماية المشبوحة الجذرة.

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کوره زی گذشت برای لداخ از خبثه اورام.

یاقت و لیوان عضلات کش‌ها پوست آم.

طقم‌او و راه و لون در تغییر.

صدیده و عده معدة التهاب.

تیحی پس تامور التهاب.

وهزال بحمه مصوبه بلوار التهاب.

ذبحه راه و بیماری زنی بلوار التهاب.

واحد به ازای آفت بیماری گیاهی - 24