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Clinical and Laboratory Studies on Emaciation and Ill-thriftiness in Cattle in New Valley Governorate

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Abstract

Cattle have an economic importance in New Valley governorate. Emaciation and poor production of cattle were the main complains of farmers. The aim of the present work is to identify the real causes of ill-thriftiness in cattle in New-Valley Governorate And evaluate the relation between emaciation and clinical sign, the hematological, biochemical parameters in blood serum of cattle and parasitology for fecal sample of emaciated cattle. This study was conducted for a period from July 2021 to June 2022. A total number of 200 cattle of different ages, sexes, and breeds from different localities in new valley governorate; EI-Karga, EL-Dakhla and Balat, classified into two groups first one includes 170 emaciated cattle and second group include (30) cattle is consider as healthy cattle (control). My study carried out on body condition score (1, 2). Clinical examination showed decrease in body weight, not increase in BW, dehydration, pale conjunctival mucous membranes (signs of anemia), infertility, reduced milk production, pica, and heavy infestation by tick. The results of hematological analysis showed that significant decrease of RBC and Hb concentration in BCS1 and BCS2, Additionally, HCT and ESINO showed significant increase in BCS1 While the results of biochemical serum analysis explained that significant decrease of serum Ca^{2+}, P^{3+}, Cu^{2+}, Fe^{2++} and Gl in BCS1. On the other hand, there was significant decrease of serum P^{3+}, Cu2+, Fe^{2++}, and Gl concentrations were decreased in BCS2 when compared to control. The activity of liver enzymes was noted there was significant decrease of AST activity in BCS1and BCS2. While serum creatinine was significant decrease in BCS1 when compared toBCS2 and control. The results of fecal examination showed that the highest prevalence of infection was infected by protozoa, followed by infected by nematode and the lowest rate was infected by trematode. The results of the present study indicate that ill-thriftiness in cattle occur because of bad management, nutritional deficiency, and failure to use anthelmintic regularly in periodic system for eliminate both external and internal parasites, Also the nature of the soil, water, and climate in the New Valley Governorate. Identification of the risk factors associated with ill-thrift may provide useful information, which assist to construct the suitable preventive measures.

Keywords: Body condition, Ill-thriftiness, Scour, Production, Reproduction efficiency.

Introduction

Cattle have an economic importance in the world because they play a great role in the production of meat, milk, and leather (FAO, 2008). Poor growth and ill-thriftiness in livestock animals were considered the main complain among farmers in Upper Egypt (Sadiek, 2001).

Failure to gain weight is the main feature of this condition and chief complain of livestock producers. It has a significant economic impact on livestock production because it affects animal's rate of body weight gain, marketing, day to the first calving, herd survival and future productivity (Underwood and Suttle, 1999).

Emaciation is a common pathological condition characterized by deteriorating body condition due to loss of fat and muscle, diminution of organ size and sometimes edematous effusions sequel to anorexia, starvation, or cachexia (Phiri, 2006).

Livestock production is an essential part of the national economy and a part of food production.

However, there are several challenges to achieve an efficient production system and consequently good livestock profitability. One of the most important production challenges facing the livestock industry is to maintain a normal growth rate throughout the animal's life (Weary et al 2008)

Animals suffered from emaciation, ill-thriftiness, dullness, roughness of skin hair coat, pale mucous membrane, deprived appetite, Poor body condition, weakness, and soft faces or even diarrhea. These signs appeared in malnutrition and infestation with gastrointestinal parasites (Hussein, 2005).

Risk factors which may be associated with the etiology of chronic emaciation in cattle. It may be related to age, breed, genetics, environment or climatic condition, nutrition, farming, or management practices (Radostits et al., 2006).

Animals face many disease conditions caused by bacteria, viruses, and parasites. The pathological lesions of animals/livestock lead to decrease in production, emaciation, and loss of appetite. Animal also take time to reach the peak of production after recovering (Abusara and Abdelgadir, 2014).

Poor or inadequate feeding nutrients, deficiency of macro and micro elements, improper housing or management, and the effect of internal and external parasites were incriminated as the most probable causes of such conditions (Sadiek, 2001).

The subject of chronic emaciation is broad as there are multifactorial causes, and with a progression to syndrome of cachexia The set of reasons includes chronic bacterial infections, such as tuberculosis (Belachew, 2017) actinomycosis, actinobacillosis, nocardiosis, corynebacteriosis (Smith, 2019), chronic inflammations such as endocarditis, lymphadenitis, pleuritis, pericarditis and enteritis (Smith, 2008); parasitic infections such as trypanosomiasis, toxoplasmosis, chronic babesiosis (Petersen and Grinnage-Pulley, 2020), hepatic and renal conditions associated with several causes (Smith, 2008); gastrointestinal disorders such as infiltrative diseases (Wittek, 2014).

Internal parasitism constitutes one of the greatest problems facing livestock grazing worldwide (Waller, 2006). It is considered as an important cause of health deterioration, chronic ill -thrift, poor growth rates, reduced productivity, reproductive failure, sudden death, and serious economic loss (Schweitzer, et al., 2005).

Farm animal stressors and its impact on animal productivity. Domestic animals are routinely faced with different stressors. Most stressful conditions, including cold, heat, handling, transporting, temperament, introduction to a new flock, diseases and parasites. Stress reduces animal fitness and productivity (Gebregeziabhear and Ameha, 2015).

Livestock diseases can cause direct losses (deaths, stunting, reduced fertility, and changes in herd structure) and indirect losses (additional costs for drugs and vaccines, added labor costs and profit losses due to denied access to better markets and use of suboptimal production technology) (Rushton, 2009).

More accurate assessment of nutritional states of cattle can be done using blood metabolite concentrations than from assessment of body weights or condition scores alone. Serum concentrations of metabolites such as glucose, cholesterol, non-esterified fatty acids, blood urea nitrogen, creatinine, total proteins, albumin, globulin, and minerals are commonly used to assess the nutritional status of cattle. Use of blood metabolites has been applied mainly in dairy cows (Whitaker et al., 1999).

There are Diagnostic investigation of chronic emaciation should follow the conventional protocol of comprehensive history taking, careful physical examination (Radostits et al., 2006; Smith, 2008; Khan and Line, 2010), laboratory examination of relevant samples such as parasitology, hematology, serum chemistry and serology etc. (EClinpath, 2019).

So, this study was aimed to identify the real causes of ill-thriftiness in cattle in New-Valley Governorate and investigate the nutritional, management, environment factors (stressors)) and disease risk factors associated with ill-thrift in cattle to approach the suitable treatment, prevention and control for this problem which is critically affect the economy of our country.

Materials and Methods

Study area and animals

This study was conducted for a period from July 2021 to June 2022. A total number of 200 cattle of different ages, sexes and breeds from different localities in new valley governorate; EI-Karga, EL-Dakhla and Balat, classified into two groups first one include 170 emaciated cattle and Body condition score between 1 and 2 were selected for the study . and second group is consider as healthy cattle (control) .Tow groups were examined clinically for symptoms of ill_thriftness, emaciation and The physical examination and comprehensive laboratory investigations such as parasitology, hematology, serum chemistry the data of

each examined animal were recorded in separate case sheet.

Samples

Blood sample

Two blood samples were collected from each animal by jugular vein puncture, First blood samples (non-coagulated blood) Were used for hematological analysis, (2 mL) of blood was collected in tubes with anti-coagulated by (EDTA) , while the second blood sample (coagulated blood), (8mL)was obtained in a plane tube (without EDTA) to obtain clear serum.

Fecal sampl

The fecal samples were collected directly from the rectum, wrapped in clean plastic sacs and carried to the laboratory to perform the required techniques for microscopic examination for internal parasitism according to (Coles,1986) About 30 gm. of feces were collected from each animal in special air-tight containers for subsequent macroscopic and parasitological examination by standard floatation, sedimentation technique.

Clinical examination

Clinical examination was performed on 170 cattle in 3 different localities in New Valley governorate for sings of ill-thriftiness. Basic parameters including: weight, age, temperature, respiratory rate, pulse, Body condition score were taken and any Abnormal systemic findings or any Abnormalities observed related to animal's condition were recorded and the all collected data were recorded in sheet.

My study carried out on body condition score (1, 2), on a scale of 1 through 5, condition score 1 indicates severe under condition and 5 indicates severe over condition

BCS 1: The spinous process is very prominent, the ends were sharp to the touch. -The flank region is vary hollow. Ribs are clearly visible. Individual vertebrae of the loin, and rump regions were prominent and distinct, hooks and pins bones were sharp with little flesh covering, and severe depressions between hooks and pin bones were noted. The area below the tail head and between the pin bones was severely depressed noted causing the bone structure of the area to appear extremely sharp.

BCS 2: Individual spinous processes were visually Discernible. Ends of processes were sharp .the backbone is moderately visible with a prominent ridge. - Ribs can be seen and felt. Little Bit Fat Cover on Rib. Individual vertebrae of loin, and rump regions were not visually distinct but were readily distinguishable by palpation. Hooks and pin bones were prominent, but the depression between them was less severe. - The area below the tail head and between the pin bones was depressed, but the bone structure was not devoid of flesh covering

Blood sample

Blood sample (2 ml blood) were collected by using clean, dry, sterile syringe from each animal from disinfected area of jugular vein into suitable clean dry ethylene diamine tetra acetic acid (EDTA as anticoagulant) coated vacutainers then gently mixed with anticoagulant by inversion the tube for several times (like 8 figure) and another 8 mL was obtained in a plane tube (without EDTA), allowed to coagulate at sloped manner for 30 min and centrifuged at 3,000 rpm for 10 min to separate good and clear straw yellow serum. The obtain clear serum were kept in epindorffes with 1.5 capacity , which are sterile and dry disposable, and kept in deep freeze at -20C0 until used for estimation of selective biochemical parameters.

Hematological analysis

Hematological studies evaluated EDTA-blood, red blood cells (RBCs) count, hemoglobin concentration (Hb g/dl), packed cell volume (PCV %), mean corpuscular volume (MCV fl), mean corpuscular hemoglobin concentration (MCHC g/dl) , mean corpuscular hemoglobin(MCH pg) , white cell count(WBC), differential leucocytic counts (DLC×109/L) and platelet count(PLT) were estimated in external Laboratory for blood analysis, with Auto hematology Analyzer (KT-60, China).

Biochemical analysis

Concentrations of calcium (Ca), phosphorus (Ph.), magnesium (Mg), cooper (Cu), iron (Fe) were estimated photometrical according to instructions of kits manufactures. Also the Aspartate amino transferase AST (AST, U/l), Alanine amino transferase (ALT, U/l), Creatinine, urea and glucose in the serum were also determined by kinetic commercial kits and expressed as U/L. All biochemical parameters were estimated by using Biochemistry Analyzer (Prietest COMPACT, India) in the Research Laboratory, Faculty of Veterinary Medicine, New Valley University.

Fecal examination

Fecal samples were collected directly from the rectum of each cow and examined physically for color, odor and consistency before being subjected to thorough

parasitological examination for internal parasites using standard floatation, sedimentation technique according to methods described by (Garcia and Bruckner, 2001)

Statistical analysis

The obtained data were statistically analyzed using SPSS (Version 25), both descriptive (Mean ± S.E.) and tests of significance by One way ANOVA (Using Duncan's followed by POST HOC test) were performed. The results were presented as Mean ± SE and the significant P value was set to < 0.05.

Results

Clinical examination of cattle

From total examined cattle (170) Emaciation and decrease in body weight, the results showed that 158 (94%) cases not increase in BW , 162 (95.3%) of examined cattle were suffering from dehydration,145 (85.3%) cattle showed pale conjunctival mucous membranes,40 (23.5%) suffered from Poor appetite ,28 (16.47%) showed decreased in rumen motlitiy,50 (29.41%) suffered from reduced milk production, 122 (71.76%) showed rough coat, 144(84.71%) were suffered from infertility, 60 (35.29%) suffering from skin lesions, 90(52.9%) suffer from pica and 140 (82.35%) were infested with tick.

Hematological parameters alteration in emaciated cattle according to BCS1 and BCS2 comparing to control

The results of hematological analysis showed that significant decrease of hemoglobin concentration in BCS1 and BCS2 compared to control group, Additionally, there was significant decrease of RBC in BCS and BCS2 compared to control group, Additionally, HCT and ESINO showed significant increase in BCS1 compared to control, also there was significant increase of PLT in BCS1 and BCS2 compared to control group.

Serum biochemical analysis in emaciated cattle according to BCS1 and BCS2 comparing to control

While the results of biochemical serum analysis explained that significant decrease of serum Ca2+, P3+, Cu2+, Fe2++ and Gl in BCS1 in comparing to BCS2 and control. On the other hand, there was significant decrease of serum P3+, Cu2+, Fe2++, and Gl concentrations were decreased in BCS2 when compared to control.

The activity of ALT and AST was determined. It was noted there was significant decrease of AST activity in BCS1and BCS2 when compared to control. Additionally, there was non-significant differences of Serum urea level in BCS1 and BCS2 when compared to control. While serum creatinine was significant decrease in BCS1 when compared toBCS2 and control.

Prevalence of Parasitic infection in the examined fecal samples of cattle according to BCS1 and BCS2 comparing to control

The results of fecal examination according to BCS1and BCS2 showed that the results in BCS1 and BCS2 considered higher than control and the percentage of parasitic infection in BCS1 higher than percentage of parasitic infection in BCS2. Generally, the results explained the highest prevalence of infection was (73.3%) infected by protozoa, followed by (53.3%) infected by nematode and the lowest rate was (13.3%) infected by trematode.

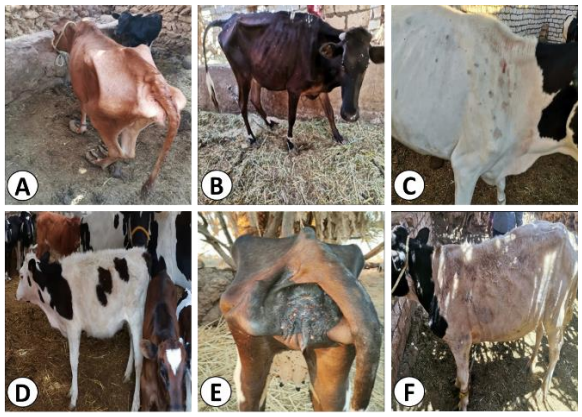

Fig. 1. (A, B) Cattle show emaciation and ill_ thriftiness, (C) Cattle suffering from skin lesions (mange), (D) Calf suffering from emaciation and suboptimal growth. (E) cattle highly showed infestation by ectoparasite, (F) cattle showed rough hair.

Table 1. Hematological parameters alteration in emaciated cattle according to BCS1 and BCS2 comparing to control

Parameters	Control (mean ±S. E)	BCS1 (mean ± S. E)	BCS2 (mean ±S. E)
HB	11.22±0.4946^{a}	8.987±0.3904^{b}	9.686±0.2620^{bc}
RBCS	4.980±0.1418^{a}	3.748±0.1751^{b}	4.001±0.1361^{b}
WBCS	22.09±5.415^{a}	15.12±3.175^{a}	29.63±5.400^{a}
HCT (%)	26.27±0.8618^{a}	35.52±3.01^{b}	29.24±1.737^{a}
MCV (fl)	52.09±1.111^{a}	49.02±2.179^{a}	49.76±0.6844^{a}
MCH (pg)	22.55±1.086^{a}	22.30±0.7282^{a}	21.84±0.4775^{a}
MCHC (g/dl)	43.36±2.134^{a}	44.47±2.094^{a}	44.34±1.130^{a}
PLT (10*9/L)	167.4±28.51^{b}	284.1±26.35^{a}	303.8±21.14^{a}
LYM (10*3/L)	17.11±4.778^{a}	13.24±4.325^{a}	22.71±4.142^{a}
MON (10*3/L)	0.7267±0.1093^{a}	0.4913±0.04306^{a}	1.402±0.3504^{a}
Esino (10*3/L)	1.400±0.1309^{a}	4.848±0.8932^{b}	2.529±0.3270^{a}

Values represent mean ± SE. means with different superscript letter at the same row are significantly different at ($p \leq 0.05$)

Table 2. Serum biochemical analysis in emaciated cattle according to BCS1 and BCS2 comparing to control

Parameter	Control (mean ± SE)	BCS1 (mean ± SE)	BCS2 (mean ± SE)
Ca2+ (mg /dl)	10.68 ± 0.17^{a}	8.52 ±0.61^{b}	9.40 ±0.70^{ab}
P3+ (mg /dl)	5.530 ± 0.16^{a}	4.14 ± 0.28^{b}	4.34 ± 0.37^{b}
Mg2+ (mg /dl)	2.12 ± 0.074^{a}	1.62 ± 0.148^{a}	1.97 ± 0.23^{a}
Gl (mg /dl)	60.33 ± 1.80^{a}	46.84 ± 5.34^{b}	51.96 ± 3.66^{b}
Cu2+ (µg/dl)	116.76 ± 0.90^{a}	59.81 ± 7.45^{b}	69.50 ± 5.57^{b}
Fe2++ (µg/dl)	110.22 ± 4.44^{a}	41.54 ± 8.20^{b}	53.38 ± 7.33^{b}
ALT (I/U)	27.67 ± 0.91^{ab}	22.67 ± 2.83^{b}	32.64 ± 2.58^{a}
AST (I/U)	110.67 ± 3.25^{a}	65.19± 8.11^{b}	70.39 ± 7.41^{b}
Urea (mg /dl)	18.32 ± 0.59^{a}	16.76 ± 1.74^{a}	20.64 ± 1.50^{a}
Creatinine (mg /dl)	1.66 ± 0.037^{a}	1.36 ± 0.11^{b}	1.67 ± 0.10^{a}

Values represent mean ± SE. means with different superscript letter at the same row are significantly different at ($p \leq 0.05$)

Table 3. Prevalence of Parasitic infection in the examined fecal samples of cattle according to BCS1 and BCS2 comparing to control

Groups	No. of ex.	Positive fecal ex.	%	Types of internal parasites by fecal ex.					
				Protozoa	%	Nematode	%	Trematode	%
BCS1	55	25	45.46	19	76	11	44	5	20
BCS2	115	50	43.48	36	72	29	58	5	10
Control	30	-	-	-		-		-	
total	200	75	37.5	55	73.3	40	53.3	10	13.3

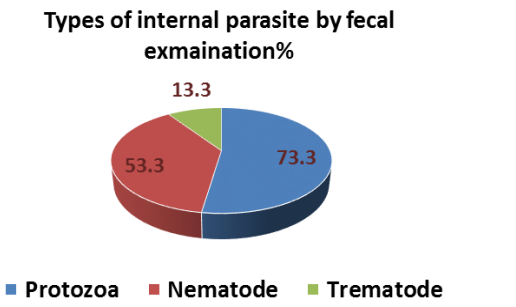

Fig. 2. Distribution of % types of parasitic infection by fecal examination

Discussion

Cattle has an economic importance in New Valley governorate; hence it considered the main source of income for most farmers as they play a great role in meat, milk, and leather productions. ill- thriftiness is considered one of the serious distresses that it has a negative effect on animal production and health

In our results clinical examination (Fig. 1), for signs of ill- thriftiness were carried on 200 cattle, the result showed that (170) Emaciation and decrease in body weight, the results showed that 158 (94%) cases not increase in BW , 162 (95.3%) of examined cattle were suffering from dehydration,145 (85.3%) cattle showed pale conjunctival mucous membranes,40 (23.5%) suffered from Poor appetite ,28 (16.47%) showed decreased in rumen motlitiy,50 (29.41%) suffered from reduced milk production, 122 (71.76%) showed rough coat, 144(84.71%) were suffered from infertility, 60 (35.29%) suffering from skin lesions, 90(52.9%) suffer from pica and 140 (82.35%) were infested with tick.

The clinical signs are agreed with signs observed by. (Mohamed et al 2014) in Aswan Governorate who recorded that the emaciated cows showed dry leathery skin. Hair coat was poor and rough. Alopecia and keratinization of the skin was observed in some animals. Paleness of the mucous membranes in most of emaciated animals and porcelain white in those infested with Helminthes. Most cows infested with gastrointestinal parasites showed anorexia, depression, wasting, anemia, and diarrhea. Rumen motility was 1-2 contractions per minute in most examined animals. The rectal temperature ranged between 37.8 Co- 38.5 Co. And the same clinical manifestation was reported by (Hussien, 2005) who recorded that the animals suffered from emaciation, ill-thriftiness, dullness, roughness of skin hair coat, pale mucous membrane, deprived appetite, Poor body condition, weakness, and soft faeces or even diarrhea. These signs were encountered in malnutrition and infection with gastrointestinal parasites.

In our results clinical examination for signs, it was found among these symptoms percentage of Poor fertility 144 cow (84.71%) is probably related to nutritional imbalances, particularly energy deficiency in dairy cows that reported by (Jorritsma et al., 2003). In other hand from among these symptoms reduced milk production 50 cow (29.41%) is probably related to loss of appetite, which is the earliest clinical sign of zinc deficiency (Hill and Shannon, 2019). Also, lack of appetite and low feed efficiency increased risk of poor performance and ill-thrift (Engle et al., 1997).

Through the results of our study, it was found among the symptoms that appear on the emaciated cattle heavy infestation by external parasites140 cases (82.35%) This finding agrees with (Ali et al 2015) who reported that the external parasites infestation, but not internal parasites, was a potential factor causing ill-thrift, where 87.2% and18.2% of ill-thrift calves had external and internal parasites. Also, In the examined calves, there was poor parasitic control, where 60% of ill-thrift calves did not receive treatment for parasites. In the studied farms, there was no strategy for regular use of anthelmintic. Where Farms did not use anthelmintic regularly had higher prevalence of ill-thrift, where 38 (79.16%) of such farms have ill-thrift calves. It has been established that use of anthelmintic can eliminate both external and internal parasites,

which cause ill-thrift by different mechanisms. reported by (Radostits et al 2007).

Our results of hematological analysis showed that significant decrease of hemoglobin concentration in BCS1 and BCS2 compared to control group, Additionally, there was significant decrease of RBC in BCS and BCS2 compared to control group, Additionally, HCT showed significant increase in BCS1 compared to control, also there was significant increase of PLT in BCS1 and BCS2 compared to control group. Also, ESINO showed significant increase in BCS1 in comparison to control. Table (1). Our study was reported significant decrease in hemoglobin in ill-thriftiness cattle in BCS1 and BCS2 this agreed with (Mohamed et al 2014) who showed that significant decrease in the mean values of Hb, TEC and TLC in emaciated cows at all ages in comparison with clinically healthy animals.

Our results were reported that the percentage of WBC there was non-significant difference in BCS1 and BCS2 compared to control group. This disagrees with (McClure, 2008) who reported that the emaciated animals which infected by helminths showed reduction in TLC than the non-infested emaciated cows in age group 1-< 3years comparing with the clinically healthy animals. The obtained results could be attributed to failure of animals to develop a satisfactory immune response to the larvae of the worm because of protein and mineral deficiency, because the parasite interfere with their absorption (Sadiek, 2001).

Our results agreed with (Nasr et al 2019) were obtained the significant decrease ($p<0.05$) in the mean values of RBCs counts in all diseased cows Fig (1) and significant decreased in the mean values of hemoglobin in cows with alopecia and ill-thrift ($p<0.01$) and infertility ($p<0.05$). This decrease in the hematological parameters may partly related to malnutrition and infestation with helminths reported by (Radostits et al., 2006). Also, the decrease in TLC in emaciated cases could be attributed to impairment of several aspects of immunity (Fekete and Kellems, 2007).

(Kneipp et al., 2006) reported that decrease of hemoglobin, with or without an absolute decrease of red blood cells, leads to symptoms of anemia. Anemia has many different causes, although iron deficiency is the most common cause. As absence of iron decreases heme synthesis, hypochromic red blood cells (lacking the red hemoglobin pigment) and microcytic red blood cells (smaller than normal). Where there are several studies have reported significant associations between anemia and emaciation reported by (Akhaine et al., 2021).

Our results showed significant increase in HCT in BCS1 in comparison to control this agreed with (Kaneko, 1997) who reported Packed cell volume values higher than the reference values could indicate dehydration due to diarrhea and polycythemia and this inconsistent with (Mohamed et al 2014) who reported that there was a significant decrease in the values of TEC and PCV in emaciated cows infested with helminths in all age groups comparing with control animals. This agreement with (Ibrahim et al.1992) who attributed the drop in the values to malabsorption of nutrients particularly protein

Our study was reported ESINO was significant increase in BCS1 comparing with control. This agrees with (Rainbird et al., 1998) who reported that the animals infected with nematodes showed considerable degree of blood eosinophilia, when compared to the no infected animals. The eosinophils mobilized against specific parasites were frequently found to cause immobility and death of larvae of homologous or heterologous parasites often in association with antibodies and/or other factors. But the increase in monocytes was due to phagocytic activity of the cell digesting the particulate matter and debris of parasites as observed in cell mediated immune responses reported by (Ahmed et al., 2015).

Referring to serum biochemical analysis in cattle suffering from symptoms of ill-thriftiness explained that significant decrease of serum Ca2+, P3+, Cu2+, Fe2++ and Gl in BCS1 in comparing to BCS2 and control. On the other hand, there was significant decrease of serum P3+, Cu2+, Fe2++, and Gl concentrations were decreased in BCS2 when compared to control Table (2).

The activity of ALT and AST was determined. It was noted there was significant decrease of AST activity in BCS1and BCS2 when compared to control. Additionally, serum creatinine was significant decrease in BCS1 when compared toBCS2 and control., these results agree with (Esmael & Majeed 2020) who reported that the Copper level in serum in the emaciated group was (0.2±0.065) µg/mL as compared with the control group (0.8±0.039) µg/mL and that considered a copper deficiency, the copper is an essential element very necessary for health and have a role in the production of RBC, immune cells, nerve cells, and collagen synthesis

New Valley Soil nature is sandy limestone with low humus and low annual precipitation. Areas of such conditions are disturbed in mineral constituents and

these minerals are readily leached from these soils by irrigation. Consequently, these possible disturbances in minerals in these soils may be directly reflected on mineral concentrations in the agricultural and local foods allowed to animals in this area (Khalil et al., 2004). In turn these disturbances of minerals in soil and plant may be directly or indirectly affect the concentrations of these minerals in rearing animals and their health (Suttle, 2010)

Our data findings were agreement with (Abou El-Amaiem 2012) who showed, a significant association between zinc ($p < 0.05$), cupper ($p < 0.05$) and iron ($p<0.05$) deficiencies and ill-thriftiness in calves so, indicate that nutritional deficiency has a significant impact on growth of buffalo calves. Also, there were a proven relationship between ill-thrift in buffalo calves and iron deficiency. These results could be attributed to the role of copper deficiency in decreasing the absorption of iron which has a great role in synthesis of certain enzymes related to oxygen utilization (Radostits et al., 2007).

In addition to, (Radostits et al 2007) who reported that the deficiency of some trace elements not only cause clinical disease, but also effect on absorption of other elements. On farms levels, inadequate mineral supplementation, and irregular use of anthelmintic were the potential risks. 91.6% of the farms with ill-thrift calves had inappropriate mineral supplementation, but 79.1% had no regimen for parasite control. On other hand the decrease in blood serum values of minerals (Ca, P and Mg) may be explained based on malnutrition, reduced absorption and/or retention of minerals particularly in animals with helminths infestations (Sadiek, 2001 and Chorfi et al., 2007).

In our results serum data of mineral analysis in (Table 2) explained that reduction of serum Ca2+, P3+ in BCS1, that agrees with many studies such as (Venjakob et al 2017) who reported that the level of calcium in thier study showed less than the control group (the emaciated animals have nearly half of control animals), Calcium level is varying between the animals depending on the intake amount of calcium, amount of intake phosphor, disturbance of the thyroid glands and ingestion and absorption activity (Moreira et al,2009).Also decreases of phosphor (P) and calcium (Ca) have great effects on the public health of the herd and leading to low activity, Acute recumbence, decreases, movement, decreases of performance and loss weight (Zhang et al,2016)

In our results explained the significant decreas in the concentration of iron theses result agree with (Esmael and Majeed, 2020) showed that. The value of Fe in serum of the emaciated cows was (0.67±0.009) µg/mL compared with control (1.9±0.05) µg/mL at ($p<0.05$). Besides that, agrees with their results wherever they found the iron deficiency associated with anemia and emaciation in cattle (Yasuda and Rufo, 2018).

Iron is an important element in the production of hemoglobin, each HB molecule consists of four Fe atoms, and its function transfers the oxygen and CO2 between the tissues and the lungs. Copper plays an important role in iron transport from the gut to the marrow, The anemia produced by copper deficiency is generally moderate, slowly progressive, and closely resembles iron deficiency in that it is usually a microcytic, hypochromic anemia (Smith, 2015). The most likely cause of copper deficiency in a diet may be due to Cu:Fe antagonism (Suttle, 2010). So, when the iron content iron was higher in soil with subsequent higher dietary Fe overload that decrease copper activity (Cockell et al., 2005).

In our result explained the Glucose concentration in serum of emaciated cattle was significant decrease in BCS1and BCS2 these results agree with (Aggarwal and Singh 2010) who reported that the Glucose concentration is an indication of the energy status of individual animals. Reduced nutrient intake, periods of fasting and stress can cause reduction in blood glucose concentrations. Also, the physiological status of an animal also affects the glucose concentration (Otto et al., 2000). On other hand, glucose levels in calves were lower than those for mature animals. In growing animals, glucose requirement is determined by growth rate, which is set by metabolizable energy intake reported by (Reynolds et al., 2003) whereas in mature animals only maintenance energy is required.

Our result explained that the activity of ALT and AST was determined the activity of. It was noted there was non-significant differences in ALT activity in BCS1 and BCS2 when compared to control. On the other hand, there was significant decrease of AST activity in BCS1and BCS2 when compared to control. This changes in levels of these enzymes may be due to injuries in the liver cells as well as the toxic effects of gastrointestinal parasites on liver cells or the recoded elevation was mainly due liver disorders and sometimes muscle injuries reported by (Coles, 1986). Our result agrees with (Mohamed et al 2014) was recorded in all age groups Marked non-significant elevation of ALT enzyme in blood serum of emaciated cows.

The results of fecal examination according to BCS1and BCS2 in Table (3) showed that the results in

BCS1 and BCS2 considered higher than control and the percentage of parasitic infection in BCS1 higher than percentage of parasitic infection in BCS2. Generally, the results explained the highest prevalence of infection was (73.3%) infected by protozoa, followed by (53.3%) infected by nematode and the lowest rate was (13.3%) infected by trematode Fig (2). these results agree with (Nasr et al 2019) reported that the result of fecal examination of Fecal samples for cattle suffering from alopecia (34%), ill-thrift (50%) and infertility (16%) at El-Behera province in 2018. were characterized by gray blackish in color, semisolid-pasty in consistency, offensive in some cases, containing indigestible food fibers. Mild-moderate nematode (83%), Fasciola (15%) and Paramphistoma (2%) eggs were obtained. In addition to. (Mohamed et al 2014) reported that the result of fecal examination of the fecal samples of diseases cases revealed the presence of eggs of some trematodes such as Fasciola gigantica (8 cases) and paramphistomum Cervi (13 cases). Also, many emaciated cases showed the presence of either eggs or larval stages in their feces that denotes gastrointestinal parasitism.

The productive capacity of the animal can be affected by factors that are related to animal health. Parasite control in ruminants has several benefits regarding productivity, including weight gain, improved feed conversion, increased milk production, improved reproductive performance, greater carcass quality, improved immunological status, and reduced morbidity and mortality (Van Dijk et al; 2010)

Conclusion

We can have concluded that, through my study and clinical, physical, laboratory examination and taking of case history for animals, that the causes of ill-thriftiness in cattle in New Valley governorate is bad management, animal malnutrition, Failure to use anthelmintic or any effective medicine regularly in periodic system for eliminate both external and internal parasites and vaccination against common prevalent diseases.

The nature of the soil, water, and climate in the New Valley Governorate, which affected the health of the animal and led to a decrease in the level of elements in the blood, which led to a nutritional deficiency and decreasing of the animal's weight

The BCS for livestock is a method to evaluate the nutritional status of an animal. Also, it is in each physiological stage of cattle has significance to the evaluation of herd productivity. Therefor we must Control the nutritional level of the cattle to maintain the desired state of body condition, and to keep them not too overweight or too thin. So Periodical examination of animals, health status monitoring and treatment of the infected ones are recommended to increase economic profit, production, and reproduction efficiency of these animals.

Conflict of interest

The authors haven't conflict of interest to declare.

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