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Effect of probiotic on body weight gain and hematobiochemical parameters in unthrifty buffaloe calves

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ABSTRACT

The present work was performed to evaluate the effects of probiotic and mineral mixture on body performance and some hematobiochemical parameters in unthrifty buffaloe calves. This experiment was done in 20 at 5 months old buffaloe calves (5 healthy calves weighing 120-150 Kgm-15 unthrifty calves weighing 80-105Kgm) belonged to privet farm in Abu Hamad city - Sharkia Province. All calves were received 1ml iovmic super /50 kgm body weight for proved all calves free from parasites. Blanced ration were formed and used during the experimental period. Each calve was received 2 kgm from formed ration and 5 kgm hay daily during 1st month of experiment and 3 kgm from formed ration and 10 kgm hay daily during 2nd month of experiment. At one month post ivomic injection calves were divided into 4 groups (5/each). 1st group healthy calves (-ve control), 2nd group unthrifty calves not treated (+ve control), 3rd group unthrifty calves received 1ml probiotic/liter drinking water for 2 months, 4th group unthrifty calves treated by 1ml probiotic/liter drinking water and 30ml mineral mixture for each calve daily for 2 months, calves in each groups were weighted at begin of experiment and at 1st day post treatment for estimation weight gain and feed conversion rate. At 1st&10th day post treatment 3 blood samples were taken from all calves for estimation hematobiochemical parameters. Our results revealed that, diseased calves show significant reduction in body weight gain, erythrocytic count, hemoglobin, packed cell volume total and differential leukocytic count, phagocytic %, killing %, serum total proteins, albumin, α, β, γ globulins, total globulins, A/G ratio, catalase and super oxide dismutase beside increase in feed conversion rate, total li-

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pid, cholesterol triglycerides and malondialdehyde,
Treatment unthrifty calves by probiotic alone for 2 months induce improve in body weight and hematobiochemical parameters but probiotic with mineral mixture induce superior improve hematobiochemical parameters and returned to nearly normal levels.
It could be concluded that calves suffering from unthriftness show many adverse effect in body performance and hematobiochemical. Using probiotic alone or with mineral mixture induced ameliorative effect of unthriftness and improved body performance and hematobiochemical parameters.

INTRODUCTION

Calves are important animals and considerable importance in many countries (**Haenlein and Ramirez, 2007).** Inadequate amounts of nutrients to animal induce untherifteness. Untherifte-ness in animal arise due to nutritional deficiency either by primary route by faulty diet (lack of essential nutrient) or secondary which results from some factors interfere with absorption and utilization (**Radostitis, et al. 1995**). Diseases are the main factor of direct or indirect losses body weight and cause unthrifty in animal (**Radostits, et al. 2003).** Unthriftness in calves occur when low growth rate (**Radostits et al. 2000**) or when animal unable to growth normally (**Mahmoud, et al. 2015).**

Probiotic is a live microorganism has health benefit on host as improve intestinal microbial balance (**Fuller, 1989**). The ideal probiotic has many characterizes such as non-toxic and non-pathogenic beside capable to induce good effect on animal body **(Fuller, 2003).** Probiotics are growth promoters and has beneficial effect on intestinal microflora Probiotics help in overcoming deleterious effects of some harmful bacteria and nutritional status (**Mahmoud and El-Sheikh 2005**). Probiotic is a very active in both small and large intestine beside improve the body performance and immunity (**Hamasalim, 2016**). Probiotics play important role in depresses enteric pathogens from colonizing in intestine, improve digestion, reduction intestinal pH and improving immuneity **(Frizzo et al. 2011).**

Animals require a number of minerals for growth and reproduction. Minerals are good nutrients have a important role in mammalian reproduction and fertility (**Akhtar et al 2009).** Mineral mixtures contain both macro and micro elements nutrients and act as cofactors for a different metabolic process **(Radostits et al 2003).** Minerals are improved growth and reproduction (**Deepak, et al. 2017).** Trace elements had been known to be of great importance in animal nutrition and play a major role in metabolism, productive performance and enzyme functions in farm animals (**Kester, 2004**). Deficiency of macro and micro elements causes unthriftness in animal (**Radostits, et al. 2000**).

This study was carried out to evaluate good effect of probiotic and mineral mixture on body performance and hematobiochemical parameters in unthrifty buffaloe calves

MATERIALS AND METHODS

Drugs:-

1-Probiotic (protexin) It is a palatable probiotic formula containing live protected microorganisms (streptococcus faecium, S thermophilus, Lactobacillus plantarum, L casei, L bulgaricus, L acidop-hilus, Bifidobacterium bifidum, Aspergillus oryzai torulopsis) produced by probiotic International limited, United Kingdom

2-Amcofos: It is trade name of mineral mixture produced by Amicomed Comp. for Veterinary Pharmaceutical prepration, Egypt. Each/1 liter contains

Phosphorus 235 gm, Magnesium diacid phosphate 1.8 gm, Sodium diacid phosphate, Zinc diacid phosphate 10.2 gm, Copper diacid phosphate 2.5 gm, Cobalt diacid phosphate 0.1 gm, Calcium diacid phosphate 10.3 gm and Purified water up to 1 liter.

Ration

Ration used in this experiment was present in table (1) and ration was analyzed for moisture, crude protein, ether extract, crude fiber, ash, and N.F.E. by standard method according **(A.O.A.C. 1990).**

Experimental animals and Experimental design:

Twenty buffaloe-calves of both sexes aged 5 months from privet farm in Abu Hamad city - Sharkia Province, 5 apparently healthy calves weighing between 120-150 Kgm-15 unthrifty calves weighing between 80-105 Kgm (suffering from unthrifty, poor growth, pale mucus membranes, rough coat and wrinkled skin with easily detached hair). All calves were received 1ml iovmic super/50 kgm body weight for proved all calves free from all parasites. Post 30 days from ivomic injection calves were divided into four groups (5 in each). 1st group healthy calves served as a control (-ve control), 2nd group unthrifty calves not treated (+ve control), 3rd group unthrifty calves received 1 ml probiotic /liter drinking water for 2 months, 4th group unthrifty calves received 1 ml probiotic/liter drinking water and 30ml mineral mixture for each calve daily for 2 months. each calve received 2Kgm from concentred formulated ration and 5 Kgm hay daily during the 1st month of the experiment and 3 kgm from formed ration and 10 kgm hay daily during the 2nd month of the experiment. Fresh clean water was freely available all over experimental period. All calves were weighted at start of experiment and the end of experment for determination weight gain and feed conversion rate. At1st & 10th day post treatment 2 blood samples were collected from all experimental calves.

1st sample was taken on tube contain EDTA for estimation blood picture **(Jain 2000)** phagocytosis (**Rouse, et al. 1980**), killing % **Woldehiwet and Rowan** (**1990**).

2nd sample was taken for in test tube for obtain clear serum for measuring total protein (**Doumas et al 1981**), protein fractions were performed using cellulose acetate electrophoresis test (**Henry et al. 1974**). total lipid (**Knight, et al 1972**), cholesterol **White et al. (1970)** triglyceride, (**Wahlefeld and bergmeyer (1974)** Super oxide dismutase (**Nishikimi et al. 1972**), catalase (**Sinha 1972**) Malondialdehyde (**Nielsen et al. 1997**).

Statistical analysis:- The obtained data was analyzed by using computerized SPSS program version 16, according **(Tambane and Dunlop 2000).**

RESULTS

Unthrifty calves show significant decrease in body weight gain, erythrocyte, hemoglobin, packed cell volume, leukocytic count, phagocytosis%, killing%, serum total protein, albumin, α,β and γ globulins, total globulins, A/G ratio, catalase and super oxide dismutase beside increase in feed conversion rate, total lipids, cholesterol triglycerides and malanodialdhyde. Treatment of unthrifty calves by probiotic alone for 2 months revealed an improve in body weight and hematobioche-mical parameters but probiotic with mineral mixture induce superior improve hematobiochemical parameters and returned to the nearly normal levels.

Table 1. ration used in experiment

Ingredient	Yellow corn	Wheat bran	Cotton seed meal	Soybea meal	Molas-ses	Calcium carbonate	Sodium chloride	Vitamins + mineral
kgm	53.5kg	15 kg	15 kg	7.5 kg	5 kg	1.5 kg	1.5 kg	1 kg

Table 2. Proximate chemical composition of feedstuffs used in formulation of the diets (analyzed).

Ingredient	Nutrient (% as fed basis)					
	Crude pro-tein%	Ether extract %	Crude fi-ber%	Ca%	Availabl Ph%	Metabolic energy Kcal / Kgm
Yellow corn	8.5	3.5	2.2	0.05	0.1	3350
Wheat bran	17	3	10.5	0.42	0.58	2383
Cotton seed meal	23	24	4	0.15	0.1	2240
Soybean meal	44	1.2	7.3	0..35	0.27	2230
molasses	6	00	00	3	6	1230
Calcium carbonate	00	00	00	38	00	00
Sodium chloride	00	00	00	00	00	00
Vitamin & mineral	00	00	00	00	00	00

Table 3. Calculated composition of the experimental diet

Crude protein%	Ether extract %	Crude fiber%	Ca %	Available Ph %	Metabolic energy Kcal / Kgm
14.148	3.899	5.93	0.8585	0.4757	2714.45

Crude protein% and Ether extract % were chemically analyzed according to the method described by AOAC (2002)
Calculated according to the feed composition by NRC (1999)

Table 3.the effect of probiotic and mineral mixture for 2 months on body performance in unthrifty calves at the end of the experiment (mean±SE) (n= 5)

Groups Parameter	Healthy calve	unthrifty calves non treated	unthrifty calves treated with	
			probiotic	Probiotic +mineral mixture
Intial body weight	146.81±2.81a	98.52±1.54b	98.09±1.29b	99.66±1.84b
Final body weight	230.56±2.55a	159.65±1.44c	180.88±1.35b	185.04±1.78b
Weight gain	83.75±1.33a	61.13± 0.21b	82.79± 0.43a	85.38± 0.76a
Feed consumpion	150	150	150	150
Feed conversion ratio (FCR)	1.79	2.45	1.81	1.76

Means with different superscripts of the same row indicate significant difference at $P < 0.05$
The results show significant difference must be demonstrated by symbol a, b and c

Table 4. Effect of probiotic and mineral mixture for on blood picture phagocytic % and index in unthrifty calves at 1st day post supplementation (mean ± SE) (n= 5)

Groups Parameter	Healthy calve	unthrifty calves non treated	unthrifty calves treated with	
			probiotic	Probiotic + mineral mixture
RBCs (10^6/mm^3)	6.92±0.61a	4.53±0.29b	6.51±0.83a	6.89±0.98a
Hb (gm/dl)	12.32±0.95a	8.95±0.78b	11.23±0.68a	12.78±0.53a
PCV %	20.3±1.33a	15.17±0.21b	19.08±0.43a	20.33±0.51a
WBC (10^6/mm^3)	9.51±0.58a	6.08±0.44b	9.07±0.48a	9.61±0.71a
Phagocytic %	76.40±1.16a	70.14±1.21b	74.08±1.06a	75.37±1.21a
Killing%	80.32±1.32a	75.13±2.43b	78.12±2.21b	79.23±1.22b

Means with different superscripts of the same row indicate significant difference at P < 0.05
The results show significant difference must be demonstrated by symbol a, b and c

Table 5. Effect of probiotic and mineral mixture for on blood picture phagocytic % and index in unthrifty calves at 10th day post supplementation (mean ± SE) (n= 5)

Groups Parameter	Healthy calve	unthrifty calves non treated	unthrifty calves treated with	
			probiotic	Probiotic + mineral mixture
RBCs (10^6/mm^3)	6.87±0.55a	4.71±0.39b	6.43±0.79a	6.55±0.69a
Hb (gm/dl)	12.09±0.87a	8.88±0.62b	14.23±0.55a	14.18±0.44a
PCV %	20.48±1.61a	15.43±0.32b	21.21±0.89a	22.87± 0.48a
WBC (10^6/mm^3)	9.49±0.21a	6.21±0.51b	9.98±0.87a	9.99±0.78a
Phagocytic %	76.62±1.45a	70.23±1.41b	76.43±1.21a	76.09±1.81a
Killing%	80.89±1.32a	75.12±1.42b	79.98±1.35b	80.46±1.21b

Means with different superscripts of the same row indicate significant difference at P < 0.05
The results show significant difference must be demonstrated by symbol a, b and c

Table 6. Effect of probiotic and mineral mixture for 2 months on protein profile in unthrifty calves at 1st day post supplementation (mean ± SE) (n= 5)

Groups Parameter		Healthy calve	unthrifty calves non treated	unthrifty calves treated with	
				probiotic	Probiotic + mineral mixture
T. protein (gm/l)		7.89±0.81a	5.06±0.89b	7.16±0.83a	7.26±0.81a
Albumin (gm/dl)		3.98±0.76a	2.36±0.21b	3.73±0.72a	3.81±0.27a
Globulin (gm/dl	α	1.08±0.09a	0.77±0.04b	0.97±0.09a	0.99±0.13a
	β	1.10±0.07a	0.81±0.07b	1.01±0.12a	0.98±0.13a
	γ	1.80±0.15a	1.12±0.19b	1.35±0.11a	1.36±0.15a
	total	3.91±0.12	2.70±0.31b	3.43±0.22a	3.45±0.41a
A/G ratio		1.02±0.21a	0.91± 0.20a	1.09±0.25a	1.10±0.22a

Means with different superscripts of the same row indicate significant difference at P < 0.05
The results show significant difference must be demonstrated by symbol a, b and c

Table 7. Effect of probiotic and mineral mixture for 2 months on protein profile in unthrifty calves at10th day post supplementation (mean±SE) (n= 5)

Groups Parameter		Healthy calve	unthrifty calves non treated	unthrifty calves treated with probiotic	unthrifty calves treated with Probiotic + mineral mixture
T. protein (gm/l)		7.82±0.47a	5.17±0.43b	7.90±0.54a	7.94±0.79a
Albumin (gm/dl)		3.94±0.48a	2.40±0.55b	3.99±0.56a	3.99±0.55a
Globulin (gm/dl	α	1.06 ±0.09a	0.97±0.08b	1.19 ±0.18a	1.21 ±0.21a
	β	1.07 ±0.07a	0.83±0.09b	1.17 ±0.21a	1.20 ±0.19a
	γ	1.75±0.15a	1.14±0.13b	1.55±0.21a	1.63±0.25a
	total	3.88±0.66a	2.77±0.33b	3.91±0.55a	3.95±0.33a
A/G ratio		1.02±0.18a	0.88±0.16a	1.02±0.18a	1.004±0.31a

Means with different superscripts of the same row indicate significant difference at $P < 0.05$
The results show significant difference must be demonstrated by symbol a, b and c

Table 8. the effect of probiotic and mineral mixture for 2 months on lipid profile in unthrifty calves at 1st day post supplementation (mean±SE) (n= 5)

Groups Parameter	Healthy calve	unthrifty calves non treated	unthrifty calves treated with probiotic	unthrifty calves treated with Probiotic + mineral mixture
total lipid (mg/dL)	231.68±1.79b	246.08±1.98a	234.71±1.52b	236.44±1.48b
cholesterol (mg/dL)	64.89±1.92b	69.17±1.36a	65.58±1.78b	64.08±1.45b
triglyceride mg/dL	59.18±1.43b	71.03±1.17a	60.50±1.36b	60.01±1.78b

Means with different superscripts of the same row indicate significant difference at $P < 0.05$
The results show significant difference must be demonstrated by symbol a, b and c

Table 9. the effect of probiotic and mineral mixture for 2 months on lipid profile in unthrifty calves at 10th day post supplementation (mean±SE) (n= 5)

Groups Parameter	Healthy calve	unthrifty calves non treated	unthrifty calves treated with probiotic	unthrifty calves treated with Probiotic + mineral mixture
total lipid (mg/dL)	229.19±1.8b	246.51±1.77a	230.32±1.65b	230.51±1.84b
cholesterol (mg/dL)	64.34±1.84b	69.99±1.41a	64.21±1.50b	64.17±1.66b
triglyceride mg/dL	59.87±1.69b	70.65±1.68a	60.78±1.61b	59.39±1.69b

Means with different superscripts of the same row indicate significant difference at $P < 0.05$
The results show significant difference must be demonstrated by symbol a, b and c

Table 10. the effect of probiotic and mineral mixture for 2 months on malondialdehyde, catalase and super oxide dismutase in unthrifty calves at 1st day post supplementation (mean±SE) (n= 5)

Groups Parameter	Healthy calve	unthrifty calves non treated	unthrifty calves treated with probiotic	unthrifty calves treated with Probiotic + mineral mixture
MDA (mmol/ml	5.70±0.77b	9.90±0.98a	4.90±0.58b	5.86±0.69b
CAT (U/ml)	4.62±0.51 a	2.62±0.49b	4.09±0.37a	4.18±0.45a
SOD (U/ml)	396.12±1.67a	380.4±1.43b	390.42±1.98a	394.76±2.98a

Means with differ superscripts of the same row indicate significant difference at $P < 0.05$
The results show significant difference must be demonstrated by symbol a, b and c

Table 11. The effect of probiotic and mineral mixture for 2 months on malondialdehyde, catalase and super oxide dismutase in unthrifty calves at 10th day post supplementation (mean ± SE) (n= 5)

Groups	Healthy	Non	unthrifty calves treated with	
Parameter	calve	treated	probiotic	Probiotic + mineral mixture
MDA (mmol/ml	5.69±0.89b	9.83±0.78a	5.12±0.53b	5.59±0.46b
CAT (U/ml)	4.59±0.36 a	2.89±0.58b	4.18±0.77a	4.50±0.59a
SOD (U/ml)	396.98±1.81a	381.98±1.94b	395.59±1.69a	396.07±2.81a

Means with differ superscripts of the same row indicate significant difference at $P < 0.05$
The results show significant difference must be demonstrated by symbol a, b and c

DISCUSSION

Calve suffered from unthirifitness revealed significant decrease in body weight, feed conumption beside increases in feed conversion rate throughout experiment as compared with healthy calves. Our results were supported by **Sadiek et al. (1994)** mentioned that unthrifty calves show decrease in body weight due to mineral deficiency or poor quality roughage and inadequate concentration of mineral. Our results were reinforced with that of **Abdou, et al. (2010)** who reported that thriftiness induce decrease in weight gain and elevation in feed conversion rate. Our results are agreed with results obtained by **Mahmoud et al. (2015)** who reported that buffaloes calves suffering from unthriftness show reduction in body weight gain and increase in feed conversion rate. Same result were observed by **Salah et al. (2022)** mentioned that unthirifitness induce decrease in body weight due to trace elements deficiency**.** This result is agreed with **Ismail, et al. (2023)** stated that unthrifty show reduction in weight gain and elevation in feed conversion rate.

In the current study, it has been noticed that calves suffered from unthiriftiness received probiotic alone or with mineral mixture for 2 months in tested dose revealed improve in body weight, weight gain and feed conversion rate all over the experimental period when compared with unthrifty non treated calves. Unthrifty buffalo calves treated with probiotic show improve in weight gain and feed conversion rate (**El-Sheikh and El Gamal 1996).**

Probiotics in calves ration induce increase in body weight, and feed conversion rate (**Reid and Friendship, 2002**). Our result was observed previously by **Alam, et al. (2010)** who reported that probiotic resulted in significant increase in weight gain and decrease in feed conversion rate. Our result was supported by result of **Abd El Fadil, et al. (2013)** who found that probiotic resulted in an increase in weight gain and decrease in feed conversion rate. Our observed data are fit with **Tiwari, et al. (2000)** who reported that mineral mixture in cow diets resulted in significant improve in body performance. Using probiotic improved body performance. **(Hamasalim, 2016).** Our result was supported by result of **Dhruvaraj et al. (2013)** mentioned that using minerals mixture induces increase in body weight gain of cattle. Goat received mineral mixture showed improved in body performance (**Deepika et al. 2021)**. Similar results were observed by **Ismail, et al. (2023)** stated that unthrifty calves treated by mineral mixture showed increase in weight gain and feed conversion rate.

In the present investigation, it has been shown that unthrifty calve showed significant decrease in erythrocytic count, hemoglobin, packed cell volume, leukocytic count, phagocytic % and Killing % all over experimental period when compared with healthy calves. On similar ground **Christopher (1992)** stated that reduction in erythrocytic count, hemoglobin may be due to impaired uptake of iron and failure of Hb formation. Reduction in erythrocytic count, hemoglobin content in unthrifty animals may be due to deficiency of iron levels leading to depression of erythropoiesis (**Radostits et al. 2000**). Growing calves suffering from unthrifty show decrease in erythrocytic count, hemoglobin, packed cell volume and leukocytic count due to decrease in iron and zinc (**El Shorbagi, 2001)** in growing buffaloe calves. Our data is supported by result reported by **Mohamed et al.**

(2014) who recorded that unthrifty calves showed reduction in blood cells due to deficiency of energy, protein and iron which are required for erythropoietin production and hemoglobin synthesis. Our observed data are fit with those reported by **Mahmoud et al. (2015)** who stated that ill thrift calves showed a decrease in erythrocytic count, hemoglobin, packed cell volume, leukocytic count, phagocytic % and Killing **%**. Same results were observed by **Salah et al. (2022)** who stated that unthirifitness induce reduction in erythrocytic count and hemoglobin due to iron deficiency**.** Similar results were reported by **Ismail, et al (2023)** who stated that calves suffering from unthriftness show reduction erythrocytic count, hemoglobin, packed cell volume and leukocytic count .

In the present experiment, unthrifty calves received probiotic alone or with mineral mixture for 60 day revealed improvment in erythrocytic count, hemoglobin, packed cell volume, leukocytic count, phagocytic % and Killing % at 1st and 10th day post administration compared with unthrifty non treated calves. Probiotic increase erythrocytic count, hemoglobin, packed cell volume, leukocytic count phagocytic % and Killing % activity (**Perdign, et al. 1986**). Our data are fit with **Rajora, et al. (1995)** who found that mineral mixture induced improvement in haematological parameters. Same change in blood picture was observed by **El-Sheikh and El Gamal (1996)** in unthrifty calves receiving probiotic. Our obtained results are in agreement with **Abd El-Khalek and Omar (2000)** who found that probiotic induced marked improvement in erythrocytic count, hemoglobin, packed cell volume and leukocytic count in calves. Probiotics in animals ration improves immune function and an increase in total leukocytic count, phagocytic % and Killing % (**Reid and Friendship, 2002**). Same results were reported by **Awaad, et al. (2003)** stated that probiotics stimulate immune system and increase in leukocytic count, phagocytic % and Killing % activity. These results are agreed with those obtained by **Abd El Fadil, et al. (2013)** stated that probiotic induce significant elevation in erythrocytic count, hemoglobin, packed cell volume and leukocytic count in calve. Probiotic is improved blood picture due to its activity in mall and large intestine and improve trace element a iron and zinc absorption (**Hamasalim, 2016**). Our data are fit with **Saurabh and Promila (2018)** who stated that iron induce improve erythrocytic count, hemoglobin, packed cell volume and leukocytic count phagocytic % and Killing % in buffaloes.

The obtained data revealed that, unthrifty calves show reduction in total protein, albumin α, β γ globulins and total globulins compared with control calves. Similar data was observed by **El-Sayed, et al. (1999)** who stated that reduction in protein profile may be due to decrease in food intake due to zinc deficiency. Reduction in protein picture in our study may be due to decrease of food intake and zinc deficiency (**Abdou et al (2010)**. Same reduction in protein picture was observed by **Abou El-Amaiem (2012)** in unthriftness in calves. Our data also is the same that reported by **Ismail, et al. (2023)** recorded that unthrifty calves show reduction in total protein, albumin and globulins.

Unthrifty calves treated probiotic or mineral mixture for 2 months in tested dose exhibited significant elevation in total protein, albumin, α,β γ globulins and total globulins at 1st and 10th day post administration compared with unthrifty non treated calves. The increase in serum proteins picture due to presence of zinc in mineral mixture leading to an increase in feed intake (**El-Sayed, et al. 1999**). This improve in protein picture in our study may be due to beneficial effect of *Lactobacillus acidophilus* colonies in intestine which improves bioviability of nutrients ***(*Jenkins, et al. 1999*).*** Similar results were observed by **Radostits et al. (2000**) stated that improvement of protein picture post using probiotic due to improve intestinal villi responsible for nutrients absorption. Our obtained result is agreed with result obtained by **Mahmoud and El-Sheikh (2005)** who recorded that improvement in protein profile in calve received probiotic may be due to probiotic increase proteolytic activity leading to increase ammonia concentration in rumen juice. Our data is agreed with those observed

by **Alam, et al. (2010)** mentioned that probiotic induce an elevation in total proteins, albumin and globulins in lamb. Our data is observed by **Abd El Fadil, et al. (2013)** recorded that probiotic plays a major in improvement in serum total proteins, albumin and globulins.

Calves suffering from unthirifitness exhibited significant elevation in total lipids, cholesterol and triglycerides. Our finding coordinates with results observed **(El-Sayed, et al., 1999)** who mentioned that increase in total lipids, and triglycerides due to reduction in food consumption due to reduction in zinc beside induce lipolysis of adipose tissue and changed by the liver to ketones**.** Our results are observed previously by **Radostits**, **et al. (2000)** stated that lipid profile increased in unthrifty calves. Our observed results are agreed with **Abdou, et al (2010)** who stated that unthrifty calves show increase in total lipid, cholesterol and triglycerides. Our obtained result is agreed with result obtained by **Ismail, et al. (2023)** reported that unthrifty calves show increase in total lipid, cholesterol and triglycerides.

Calves suffering from unthrifty received probiotic alone or with mineral mixture for 2 months revealed improvement in total lipids, triglycerides and cholesterol levels at 1st and 10th days post administration when compared with unthrifty non treated calves. Same observed results were reported previously by **Radostits**, **et al. (2000)** who mentioned that an improve-ment in lipid profile post treatment with mineral mixture. Same result was observed by **Alam, et al. (2010)** recorded that probiotic induce reduction in lipid profile. In Same direction **Abd El Fadil, et al. (2013)** stated that probiotic show reduction in lipid profile

From our study it observed that unthrifty calves exhibited significant increase in malondialdehyde beside decrease in antioxidant enzymes (Catalase and super oxide dismutase) as compared with healthy control calves. Our observed data are not fit with those reported by **Smart et al. (1992)** who found that copper deficiency induce elevation in mlanodialdhyde and reduction in catalase and superoxide dismutase. Our observed data are not fit with those reported **Abou El-Amaiem (2012)** who reported that diseased calves revealed an elevation in mlanodialdhyde and a decrease catalase and super oxide dismutase**.** Our obtained result is agreed with the result obtained by **Mahmoud et al. (2015)** who reported that diseased calves revealed decrease in antioxidant enzyme. Our observed results are in agreement with **Salah et al. (2022**) who stated that diseased calves show reduction in Catalase and super oxide dismutase.

The results in our study revealed that, diseased calves treated with probiotic or mineral mixture for 2 months in tested dose exhibited significant decrease in malanodialdhyde and increase in Catalase and super oxide dismutase when compared with unthrifty non treated calves. Probiotic increased catalase, and super oxide dismutase beside decrease in Malondialdehyde (**Perdign, et al. 1986**). Same observation were comparable with **Abd El Fadil, et al. (2013)** who mentioned that probiotic induce improvement in serum antioxidant enzyme (Catalase and super oxide dismutase).

It could be concluded that calves suffering from unthrifttness show many adverse effects in body performance, hematobiochemical. Using probiotic alone or with mineral mixture inductees' ameli-oratve effect on unthrifty calves and improved body performance, hematobiochemical parameters.

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