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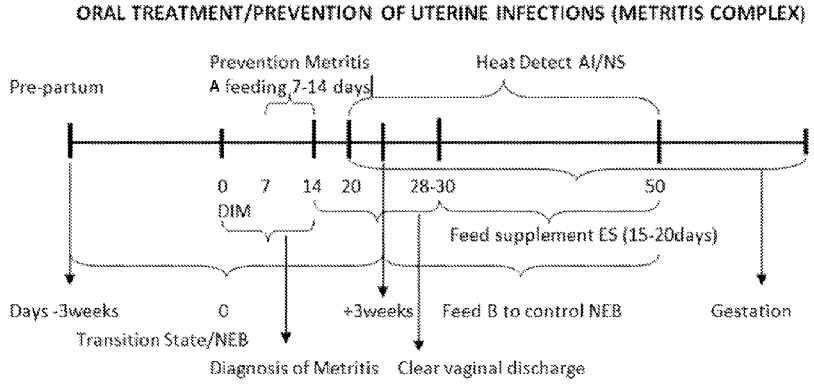

Fig. 1

(57) Abstract: The present invention relates to dietary compositions to control infections & metabolic disorders in stock and method for the treatment to an animal. The invention also relates to the dietary feed supplement mineral source /non-protein nitrogen source, salt (NaCl) and energy source as SELF CURE strategy considered to control negative energy balance related immunosuppressant associated infections and metabolic disorders of livestock particularly domesticated ruminant animals and non- domesticated animals. Dietary compositions as mineral supplements to control infections and metabolic disorders in livestock comprising: 40 to 70 wt% mineral salts, 10 to 50 wt% non-protein nitrogen source and 10 to 30 wt% of salt (NaCl) and further comprising hydrophobic component, binder and fillers. The al feed compositions to control infections and metabolic disorders in livestock comprising: 2 to 10 wt % of mineral supplements of formulation A or B of the invention and 90 to 98 wt% of the concentrated feed. Method of prevention and/or treatment of inflammatory diseases of uterine, kidney and mastitis comprising: feeding 2 to 10 wt% of mineral supplements product of formulation A by ing with 90 to 98 wt% of the concentrated feed to the livestock daily two to three times daily in divided doses depending upon the body condition score of scale 1-5 or 1-10 and for 1-2 in 1-5 point BSC/and or 1-4 in 1-10 point scale is feed three times daily whereas above 4 and 2 point BCS this range feed two times daily. Method of prevention of negative energy balance and ketoacidosis during productive and transition state or lactating state and/or sequel

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and corrective majors after treatment of inflammatory complex diseases comprising: feeding 2 to 10 wt% of mineral supplements product of formulation B by mixing with 90 to 98 wt% of the concentrated feed to the livestock daily two to three times daily in divided doses depending upon the body condition score of scale 1-5 or 1-10 and for 1-2 in 1-5 point BCS/and or 1-4 in 1-10 point scale is feed three times daily whereas above 4 and 2 point BCS range feed two times daily.

DIETARY COMPOSITIONS TO CONTROL INFECTIONS & METABOLIC DISORDERS IN LIVESTOCK AND METHOD THEREOF

FIELD OF INVENTION AND USE OF INVENTION

The present invention relates to dietary compositions to control various infections & metabolic disorders in livestock and method for the treatment to an animal. The invention also relates to the dietary feed supplement mineral source /non-protein nitrogen source, salt (NaCl) and energy source as *SELF CURE* strategy considered to control negative energy balance related immunosuppressant associated infections and metabolic disorders of livestock particularly domesticated ruminant animals and non-domesticated animals.

STATE OF ART IN THIS FIELD/ BACKGROUND OF THE INVENTION/ (PRIOR ART AND PROBLEM TO BE SOLVED)

The present invention provides dietary compositions and the methods for the treatment, prevention, and control of disproportional energy metabolism (fatty liver, ketosis, ruminal acidosis); disturbed mineral utilization (milk fever, sub-clinical hypocalcemia); and perturbed immune function (retained placenta, metritis, cervicitis, pneumovaginitis, mastitis, cystitis, urethritis, pyelonephritis etc).

Lactating livestock (cattle dairy, beef, buffaloes, etc.) are fed a ration including roughage, and concentrates (low-fiber, higher energy materials), such as silage and corn or other grains. The nutritional composition of the ration will be found to vary considerably over a period of time, due to the changes in the nutrient content which are observed during various harvesting period of time and even a single crop growing season, losses in nutrients during storage, and the wide variation in soil nutrient contents from one plot to another. For this reason, it may not be practical to provide a completely balanced ration using only crop materials. If the output exceeds input, the animals meet out their normal requirements by mobilization from its body reserves for a shorter period. For longer duration of nutritional imbalances, deficiencies or in excess or erratic management of feeding programs for dairy cows can create large numbers of various types of health problems generally categorized as metabolic diseases like fatty liver syndrome, clinical ketosis, and displaced abomasums, retained placenta, metritis, and mastitis through impaired immune function etc. (Giulia Esposito, Pete C. Irons, Edward C. Webb, Aspinas Chapwanya. Review article Interactions between negative energy balance, metabolic diseases, uterine health and immune

response in transition dairy cows Animal Reproduction Science 144 (2014) 60–71; E. Humer , A. Khol-Parisini , L. Gruber, T. Wittek , J. R. Aschenbach and Q. Zebeli. Metabolic adaptation and reticuloruminal pH in periparturient dairy cows experiencing different lipolysis early postpartum. animal, Vol.10, Issue11,Nov.2016,pp.1829-1838.
DOI: http://dx.doi.org/10.1017/S1751731116000859).

There are no nutritional supplements or technologies currently available that will be maintaining cattle in proper nutritional status effectively during the nutritionally mismanaged cattle. There is a need for nutrition strategies which reduce susceptibility to production diseases and our understanding of the interactions between nutrition and immunity remains superficial (Giulia Esposito, Pete C. Irons, Edward C. Webb, Aspinas Chapwanya. Review article Interactions between negative energy balance, metabolic diseases, uterine health and immune response in transition dairy cows Animal Reproduction Science 144 (2014) 60–71).

Animal husbandry has entered the era when the use of antibiotics or other pharmaceutical products is increasingly *unwelcome* as antimicrobial resistant pathogens which may endanger both the animal and public health.

Table 1. The average cost of treatment of disorders and inflammatory diseases from the lit.

IMPACT OF HEALTH EVENTS			
	Incidence/Lactation Range	Cost($) per case	Culling Risk
Mastitis	12-40%	$155-224	32.7
Lameness	10-48	$177-469	16
Metritis	2-37%	$300-358	17.1
Retained Placenta	5-15%	$206-315	31.7
Displaced Abomasums	3-5%	$494	26.9
Ketosis	5-14%	$117-289	32.5

It typically takes 12 to 15 years for a drug to come to market, and the success rate for antibiotics is between 1.5 and 3.5%. Study of Drug Development of the average cost to develop and gain marketing approval for a new drug is $2.6 Billion (Tufts Center for the Study of Drug Development PR Tufts CSDD 2014 Cost Study).Unlike development of new drugs to improve on old ones, the commercial returns for new antibiotics are uncertain until resistance has emerged against a

previous generation of drugs (Securing New Drugs for Future Generations: The Pipeline of Antibiotics. O'Neill Review on Antimicrobial Resistance 2015).

Current methods are of high cost, not always reliable, labor-intensive, require skill and experience and have negative impact on a dairy farmer's profitability. Considering the antimicrobial resistance and failure of the current treatment therapy, inventor has tried his best in developing new dietary feed supplement with mineral source /non-protein nitrogen source and salt (NaCl) and nutrient source as *CLEAN, GREEN, ETHICAL, ECONOMICAL AND ENVIRONMENT FRIENDLY SELF CURE* strategy considered the most appropriate means to counteract (i.e "prevention is better than cure")as an immunomodulatory substance sidesteps these concerns by controlling the negative energy balance and microbial susceptibility.

The prior art reports revealed the information regarding dietary compositions for livestock. Though there are prior arts reported for the dietary compositions and methods for prevention and control of infections in lactating livestock but there exists drawbacks in the prior art for the efficient prevention and treatment of various infections and metabolic disorders which occur in lactating livestock and also the prior art are not eco-friendly. Moreover, none of the prior art discloses or teaches the cost-effective, efficient and eco-friendly dietary compositions for control of various infections and metabolic disorders in lactating livestock. Therefore, the present inventor aim is to overcome the drawbacks of the prior art compositions and methods by developing the simple, cost-effective, efficient and eco-friendly dietary compositions for control of various infections and metabolic disorders occurring in lactating livestock.

OBJECTS OF THE INVENTION

The primary object of the present invention is to develop an ideal/magic *self- cure* feed supplement compositions to control the negative energy balance which can enhance the innate immunity at the various stages of productive and reproductive stage of herd's life in domesticated lactating livestock.

Another object of the present invention is to develop an ideal/magic *self- cure* feed supplement compositions to control the negative energy balance and the replacement of antimicrobial drug treatment therapy by suitable innate immunity building dietary compositions to control various infections and metabolic disorders in livestock without affecting productive and reproductive performance of livestock which indirectly a risk for human health and agricultural soil micro flora.

Another object of the present invention is to develop an ideal /magic *self–cure*; feed supplement compositions that control the impact of health events are the risk factors of negative energy balance with the low cost balanced nutritional supplements.

A further object of the invention is to provide dietary compositions which do not produce any undesirable byproducts, which do not cause any side effects to the lactating livestock.

A further object of the invention is to provide dietary compositions which are safe and practical to use with little technical expertise.

It is a further object of the present invention to provide dietary compositions having a longer shelf life and stable supplement.

SUMMARY OF THE INVENTION

The invention relates to the dietary feed supplement mineral source /non-protein nitrogen source, salt (NaCl) and energy source as *SELF CURE* strategy considered to control infections and metabolic disorders of livestock particularly domesticated ruminant animals and non-domesticated animals. The present invention provides compositions and the methods for the treatment, prevention, and control of disproportional energy metabolism (fatty liver, ketosis, subacute, acute ruminal acidosis); disturbed mineral utilization (milk fever, sub-clinical hypocalcemia); and perturbed immune function (retained placenta, metritis, mastitis) and cystitis, urethritis, pyelonephritis etc.

The ascending (clinical/ subclinical) inflammatory multi-factorial complex diseases of lactating livestock (cattle and buffaloes etc.) are caused by aerobes and anaerobes, gram +/- bacteria, including mycoplasmas, viruses, fungi/yeast, and algae. These ascending inflammatory complex diseases of kidney, uterus, and mammary gland treatment routes, such as local(i.e. intrauterine or intra- mammary) or systemic(i.e., IV, IM, SC) with antimicrobial agents such as antibiotics with or without (non-steroidal anti-inflammatory agents (NSAID), hormones, low intensity radiation, enzymes, multivalent vaccines, disinfectants are available but the results did not demonstrate any beneficial effect on clinical cure rate, inflammatory parameters or elimination of bacteria, fertility and metabolic disorders. Antibiotics do not kill either virus or fungi, and need several days of action to achieve good results. Antibiotics do not differentiate among “good” and “bad” bacteria, thus, they also kill benign bacteria. In such a case, the body of the cow may not be strong enough to fight new infections. (*Galvão, K.N. Greco L.F. SáFilho, M.F, and Santos J.E.P. (2009a): Effect of*

intrauterine infusion of Ceftiofur on uterine health and fertility in dairy cows. Journal of Dairy Science, 92: 1532-1542; Julia Jeremejeva, Toomas Orro, Andres Waldmann and Kalle Kask Acta Veterinaria Scandinavica 2012, 54:45 Page. http://www.actavetscand.com/content/54/1/45;.Klibs N. Galvão, Carlos Risco, and Jose E.P. Santos. Identifying and Treating Uterine Disease in Dairy Cows. VM179, one of a series of the Veterinary Medicine-Large Animal Clinical Sciences Department, UF/IFAS Extension. Original publication date May 2011. Revised April 2012. Reviewed January 2015. Visit the EDIS website at http://edis.ifas.ufl.edu). (https:// www. uvm.edu/extension/agriculture/ faccp/ files/ aglabor_ bilingual/milk_ quality _posters.pdf.; Oliveira, L., C. Hulland, and P.L. Ruegg. 2013. Characterization of clinical mastitis occurring in cows on 50 large dairy herds in Wisconsin. J. Dairy Sci. 96:7538-7549). Antimicrobial peptides (APs, bacteriocins) in vivo activity is decreased and are cytotoxic to mammalian eukaryotic cell and are considered to be poor drug candidates and their synthesis is often challenging with high associated R & D costs (Antibacterial Peptides: A Review Christine Cézard, Viviane Silva-Pires, Catherine Mullié and Pascal Sonnet ;©FORMATEX 2011; Pichereau C, Allary C. Therapeutic peptides under the spotlight European Biopharmaceutical Review. 2005; Winter issue:88-91; Science against microbial pathogens: communicating current research and technological advances. A_.Méndez-Vilas_(Ed).

Antimicrobial resistance is threatening humans and animals worldwide (Antibiotic usage in 2013 on a dairy CAFO in NY State, USA *Marie Doane, Sirkku Sarenbo* Infection Ecology and Epidemiology 2014, 4: 24259- http://dx.doi.org/10.3402/iee.v4.24259) and animal husbandry has entered the era when the use of antibiotics or other pharmaceutical products is increasingly *unwelcome* as antimicrobial resistant pathogens which may endanger both the animal and public health. Additionally, the presence of antibiotic residues in the environment, associated with overuse of antimicrobial drugs, may adversely influence the manure treatment systems by inhibition of biogas production & the soil community to establish persistent reservoirs of resistant bacteria "As an example, the third-generation cephalosporin, ceftiofur is widely used to treat respiratory infections, metritis and pododermatitis in cattle. Within 24 h, the bulk of ceftiofur and its metabolites excreted into faeces (~ 30%) and urine (~ 70%) (Jaglan, P. S.; Kubicek, M. F.; Arnold, T. S.; Cox, B. L.; Robins,R. H.; Johnson, D. B.; Gilbertson, T. J. Metabolism of ceftiofur: nature of urinary and plasma metabolites in rats and cattle. J. Agric. Food Chem.1989, 37, 1112–1118.;Hornish RE, Kotarski SF. Cephalosporins in veterinary medicine - ceftiofur use in food animals. Curr Top Med Chem. 2002 Jul;2(7):717-31.; *Douglas R .Call , Louise Matthews, Murugan Subbiah and Jinxin Liu*

Do antibiotic residues in soils play a role in amplification and transmission of antibiotic resistant bacteria in cattle populations? Front Microbiol. 2013 Jul 11;4: 193. doi: 10.3389/fmicb.2013.00193. eCollection 2013). If these excreted antibiotics are bioavailable in the environment, then they might exert sufficient pressure on the soil community to establish persistent reservoirs of resistant bacteria (Call, D.R., Matthews, L., Subbiah, M., and Liu, J. (2013) Do antibiotic residues in soils play a role in amplification and transmission of antibiotic resistant bacteria in cattle populations? Front Microbiol 4**:** 193).

It has been well established thought that all the living organisms required balanced nutrition at various stages of life cycle. For this reason, it may not be practical to provide a completely balanced ration using only crop materials. If the output exceeds input, the animals meet out their normal requirements by mobilization from its body reserves for a shorter period. For longer duration of nutritional imbalances, deficiencies or in excess or erratic management of feeding programs for dairy cows can create large numbers of various types of health problems generally categorized as metabolic diseases like fatty liver syndrome, clinical ketosis, and displaced abomasums, retained placenta, metritis, and mastitis through impaired immune function and etc due to the colonization of the pathogens in the organs in a particular part of the animal's body and for the same purpose there is no silver bullet in the management gun in this miss-managed lactating livestock(beef cattle, dairy cattle, buffaloes, etc) sheep and like. Therefore, there is an urgent need of the well balanced nutritional feed balanced diet i.e minerals and other components such as suitable nitrogen source and salt (NaCl) an energy source which itself has a capacity to control the negative energy balance and related metabolic and infectious disorders with the static feeding orally in a period of short duration by taking care animals welfare without affecting the animal and human health and environmental soil, water pollution with treatment time and veterinary cost.

STATEMENT OF THE INVENTION

Dietary compositions as mineral supplements to control infections and metabolic disorders in livestock comprising: 40 to 70 wt% Mineral salts, 10 to 50 wt% non-protein nitrogen source and 10 to 30 wt% of NaCl and composition further comprising hydrophobic component, binder and fillers. The mineral salts include major minerals as well as trace minerals, the major minerals are selected from the group of calcium, potassium, phosphorous, sulfur, magnesium and trace minerals are selected from trace minerals from Zinc, Iron, Copper, Cobalt, Barium, Iodine, Manganese,

Molybdenum, and Selenium. The formulation A is having 5 to 10 wt% calcium, 3 to 8 wt% phosphorous, 10 to 20 wt% salt (NaCl), 12 to 18 wt% non-protein nitrogen source and 0.01 to 0.025 wt% of trace mineral elements. The formulation B is having 50 to 60 wt% of mineral salts, 15 to 20 wt% of non-protein nitrogen source and 25 to 30 wt% of salt (NaCl). The non-protein nitrogen source selected is urea.

Animal feed compositions to control infections and metabolic disorders in livestock comprising: 2 to 10 wt% of mineral supplements of formulation A or B and 90 to 98 wt% of the concentrated feed.

Method for preparation of dietary compositions as mineral supplements to control infections and metabolic disorders in livestock comprising: (a) blending of 40 to 70 wt% Mineral salts, 10 to 50 wt% non-protein nitrogen source and 10 to 30 wt% of salt (NaCl) to form the ingredient component; (b) Combining mineral salts blend obtained in step (a) with hydrophobic component to form a supplemental blend; (c) Processing the supplemental blend obtained in step (b) by forcing through an orifice and dividing into the pellets/densified to blocks/ lick blocks; (d) the mineral supplement obtained in step (c) is cooled and/ or dried to use as the mineral supplement in dietary compositions.

Method of prevention and/or treatment of inflammatory diseases of uterine, kidney and mastitis comprising: feeding 2 to 10 wt% of mineral supplements product of formulation A by mixing with 90 to 98 wt% of the concentrated feed to the livestock daily two to three times daily in divided doses depending upon the body condition score of scale 1-5 or 1-10 and for 1-2 in 1-5 point BCS/and or 1-4 in 1-10 point scale is feed three times daily whereas above 4 and 2 point BCS this range feed two times daily.

Method of prevention of negative energy balance and ketoacidosis during productive and transition state or lactating state and/or Sequel and corrective majors after treatment of inflammatory complex diseases comprising: feeding 2 to 10 wt% of mineral supplements product of formulation B by mixing with 90 to 98 wt% of the concentrated feed to the livestock daily two to three times daily in divided doses depending upon the body condition score of scale 1-5 or 1-10 and for 1-2 in 1-5 point BCS/and or 1-4 in 1-10 point scale is feed three times daily whereas above 4 and 2 point BCS this range feed two times daily.

DETAILED DESCRIPTION OF THE INVENTION

DEFINITIONS:
Clinical disease definitions in a study of ketosis in European dairy cows*

Diagnosis	Definition
Twins	Production of more than 1 calf
Dystocia	Assistance with parturition due to difficulties with calving
Abortion	Birth of a calf before 270 d of gestation
Retained placenta	Placenta present more than 24 h after calving
Milk fever	Cow requires treatment with calcium by subcutaneous or intravenous injection due to clinical signs of milk fever, including down and unable to rise; muscular weakness, including S-bend in neck; cold extremities; dry nose; or constipation. (Cow is not regarded as having milk fever if a calcium treatment is given only because of age or other risk factor or as a preventive).
Metritis	Purulent and smelly uterine discharge with temperature ≥39.5°C (103.5°F)
Mastitis	Change in the appearance of the milk or udder indicative of infection
Displaced abomasum	Presence of a gas-filled abomasums Son the left or upper right flank, giving a characteristic “ping” sound on percussion or splashing on ballottement
Lameness	Locomotion score of 2 or more (scale of 0–3); cow is noticeably lame on 1 or more limbs, and the affected leg(s) can be identified
Gastrointestinal disorder	Change in fecal consistency from that typical for herd, or individual, possibly combined with changed rumen activity (reduced cudding an abnormal rumen activity)
Clinical ketosis	Decrease in milk yield (perceived or recorded milk yield decrease ≥10% with no signs of estrus; udder not full before milking), reduced feed intake and (or) appetite (cow not feeding vigorously, standing back from feed trough; decrease/refusal in concentrate intake), low rumen fill, reduced activity or demeanor (dullness, listlessness), excessive loss of body condition (loss of BCS compared with immediate postcalving BCS of 1 unit or more; dull coat, indicative of weight loss), constipation/ reduced fecal output or hard/dry feces, ketone odor in breath/milk, nervous signs (weakness, mania, apparent blindness, pica)

*Anna C. Berge and Geert Vertenten A field study to determine the prevalence, dairy herd management systems, and fresh cow clinical conditions associated with ketosis in western European dairy herds Journal of Dairy Science Vol. 97 No. 4, 2014. http://dx.doi.org/ 10.3168/jds.2013-7163.

PYELONEPHRITIS is inflammation of the RENAL PARENCHYMA and the RENAL PELVIS. Pyelonephritis (along with toxic nephrosis) is one of the most common clinically recognized renal disorders of cattle. The acute exacerbation of this chronic disease is typical of most cases of nephritis. What agents would you suspect in this case of pyelonephritis?.

The use of the terms “heat sink,” “mineral source,” “non-protein nitrogen source,” “lubricant,” etc. are not meant to refer to components or materials that are mutually exclusive of each other. Rather

there may be and likely will be at least some overlap between the materials that fall under these terms (e.g., urea can be a non-protein nitrogen source and a heat sink).

Table 2. Estimated component cost per case (totals may differ from sum of costs due to rounding)

Items($)-ve value	HYPERKETONEMIA	Displaced Abomasum	Metritis	Mastitis*
Direct cost	0	0	0	128
Diagnostic	0	1	0	10
Therapeutic	219	3	75	36
Discarded milk	14	0	5	25
Veterinary service	75	0	0	4
Labor	40	2	11	21
Death loss	141	29	28	32
Indirect cost				316
Future milk production loss	56	30	109	125
Future culling losses/Replacement loss*	133	5	18	182
Future reproduction losses	29	39	150	59
Total	707	111	396	444

J. A. A. McArt, D. V. Nydam , and M. W. Overton. Hyperketonemia in early lactation dairy cattle: A deterministic estimate of component and total cost per case. J. Dairy Sci. 98(3), 2015:2043–2054. http://dx.doi.org/ 10.3168/jds.2014-8740.

*Accurate decision making regarding mastitis control relies on understanding the economic impacts of clinical mastitis, especially the longer term indirect costs that represent 71% of the total cost per case of mastitis. Future milk production loss represents 28% of total cost, and future culling and replacement loss represents 41% of the total cost of a case of clinical mastitis. In contrast to older estimates, these values represent the current dairy economic climate, including milk price ($0.461/kg), feed price ($0.279/kg DM (dry matter)), and replacement costs ($2,094/head), along with the latest published estimates on the production and culling effects of clinical mastitis. (E. Rollin, K.C. Dhuyvetter, M.W. Overton. The cost of clinical mastitis in the first 30 days of lactation: Aneconomic modeling tool. Preventive Veterinary Medicine 122 (2015) 257–264 http://dx.doi.org/10.1016/ j. prevetmed. 2015.11.006).

October 2013 – Infertility is the single largest reason for culling female animals from a herd in **India with 41% of total animals being culled due to infertility (**http://genusabsindia.com/abs-conception-answer-to-infertility/).

The part of buffalo cows culled for gynecological reasons was the biggest -41 %(T. Peeva, Y. Ilieva, Longevity of buffalo cows and reasons for their culling Ital.J.Anim.Sci. vol. 6, (Suppl. 2), 378-380, 2007).

Table 3. Financial impact of 41% infertile cattle culling in dairy and beef

Year	Cattle (in 1000 heads)*	41% Infertile culled	Healthy Avg. Sales ₹50000/head**	Sales Avg. ₹13500/ head ** * Crores	Net economic loss₹ in Crores
India					
2016	302,600	124066.00	620330.0000	164387.4500	455942.55
2017	303,350	124373.50	621865.0000	164794.8875	457070.1125
World					
2016	988,599	405325.59	2026627.9500	537056.4068	1489571.5432
2017	998,313	409308.33	2024691.6500	542333.5373	1482358.1127

*Foreign Agricultural Service/USDA /Office of Global Analysis October 2016.
**Market value m Large variation in price from ₹30,000-70,000/head depending size and milk yield per lactation therefore ₹50,000/head.
***Total selling price of unproductive buffalo (for meat purpose) after rearing for 5 years (depending on live weight (approx 200 kg) 10,000-11,000 Source: FICCI primary survey. ₹16000 Source: USDA, Economic Research Service using data from Federation of Indian Chambers of Commerce and Industry. ₹10,000+11,000=21,000/2=₹10,500/head+₹16,000/head=₹26500/2=₹13250/head).

In India, the economic losses due to mastitis have increased about 115 folds in the last five decades and presently the loss due to mastitis is to the tune of ₹ 7165.51 crore per annum. Since mastitis affects the milk quality, its consequences are not restricted only to the farm but expand beyond the dairy farm. Recent studies reported high incidence of subclinical mastitis ranging from 20 to 83 % in cows and 45 % in buffaloes. More than 100 recent studies spread over 32 states of India indicate that the overall prevalence of mastitis ranges from 25 to 97 % with an average prevalence of 45 %.

The effect of mastitis is not restricted to only mammary system but also affects the reproduction ability of the affected animals. Bacterial toxins released during mastitis influence conception and early embryonic survival in affected cattle by stimulating the production of PGF2α, which subsequently causes luteal regression, thus, potentially causing the loss of an established pregnancy. Clinical mastitis also induces hormonal alterations like decreased pulsatile secretion of luteinizing hormone (LH), significant decrease of the ovulatory LH peak, decreased estradiol production leading to decreased estrous expression and failure of ovulation. It has been reported that the probability of conception decreased by 44% when mastitis occurred the week before insemination, by 73% when mastitis occurred the week of insemination, and by 52% when mastitis occurred the week after insemination.

The effect of mastitis does not limit only to the affected animals but also continue on the developing fetus since the daughters born to the cows that suffered mastitis during gestation have reduced reproductive efficiency. Mastitis in pregnant cows could decrease the number of healthy follicles in the developing fetus and compromise future fertility. Anti-Mullerian hormone, a reliable bio-marker for potential fertility, is severely decreased in the developing fetus as the number of mastitis events during gestation of their dams increase (A QUARTERLY NEWS LETTER OF DAIRY SCIENCE & TECHNOLOGY Newsletter_april_june Volume 17 No. 1 April – June, 2012 NDRI www.ndri.res.in).

In an estimate from the USA, it is reported that each case of metritis leads to loss of $304 to $354 to the producer due to losses in production and performance. Uterine infection is also associated with lower milk yield and it this associated with retained placenta then the magnitude of milk loss is further high. It has been calculated that high yielding cow with mild and severe metritis produced 5.7 and 8.7 kg less milk, respectively than healthy cows during the initial three weeks of postpartum period. In buffaloes, it has been reported that the milk yield decreased by 239 kg in retained fetal membrane, 181 kg in stillbirth, 173 kg in dystokia, and 98 kg in metritis in a single lactation with increased number of services per conception (A QUARTERLY NEWS LETTER OF DAIRY SCIENCE & TECHNOLOGY. http://www. ndri.res.in/ndri/documents/newsletter_april_june_2013.pdf).

Microorganisms must have energy and carbohydrates to use urea to make protein. It is important to have ammonia released simultaneously with available energy and carbon skeletons for ammonia to be converted to microbial protein. Urea is less well utilized when it is fed with hey or other forages alone than when with starch or cereal grains are included in rations in the rumen for good use of urea by bacteria. Thus cattle on high -grain rations can derive a larger percentage of their protein needs from urea than cattle on roughage rations.

Methionine, thiamine, and biotin cannot be synthesized by mammalian tissues. These nutrients must either be supplied through the diet. When provided with adequate substrates, nitrogen, energy, and S; rumen microbial synthesis of methionine, thiamine, and biotin can supply enough of these compounds to the ruminant to meet regular requirements with the possible exception of very high production cows. Therefore only ruminants can be said to have a dietary requirement of S.

The first embodiment dietary compositions are highly effective in preventing inflammatory microbial infection and metabolic disorders in livestock by boosting the immune system. The mineral source

and non-protein nitrogen combination may include at least about 65-70 wt. % (A) of the mineral source based on total combination weight.

Another embodiment the dietary compositions are highly effective in preventing metabolic disorders in livestock by boosting the immune system. The mineral source and salt (NaCl) combination may include at least about 65-68 wt. % of the mineral source based on total combination weight.

Another embodiment the dietary compositions are highly effective in preventing gastrointestinal microbial infection and metabolic disorders in livestock by boosting the immune system. The non-protein nitrogen source and salt (NaCl) combination may include at least about 64-69 wt. % (A) of the mineral source based on total combination weight.

The first embodiment dietary compositions are highly effective in preventing inflammatory microbial infection and metabolic disorders in livestock by boosting the immune system. The mineral source in combination may include at least about 32-36 wt. % **(A)** of the mineral source based on total combination weight.

In one embodiment the mineral source/non-protein nitrogen source combination may include at least about 73 wt. % (B) of the mineral source based on total combination weight and other optional components to make up mineral supplement.

Another embodiment the mineral source/salt (NaCl) source combination may include at least about 81.37 wt. % (B) of the mineral source based on total combination weight and other optional components to make up mineral supplement.

Yet other embodiment the non-protein nitrogen source and salt (NaCl) combination may include at least about 45.63 wt. % (B) of the mineral source based on total combination weight.

The mineral supplement may be combined with bulk feed to produce a mineral supplemented animal feed. The mineral supplement may also optionally include a binder, filler hydrophobic component.

The mineral supplement may include at least about 50 wt. % of the ingredient component. In another embodiment, the mineral supplement may include at least about 1 wt. % or suitably at least about 2 wt. % of the hydrophobic component.

The mineral supplements described herein are useful as a supplement in feed applications such as animal feed. The mineral supplement may also include a hydrophobic component. The mineral may also include one or more materials that function as nitrogen source and as heat sink during the pelletizing process. The materials that function as heat sink may include materials that make up the hydrophobic component and /or the ingredient component.

As mentioned previously, the ingredient component of the mineral supplement refers to combination of the mineral source and the non-protein nitrogen source, if any, that is the mineral supplement. In one embodiment, the mineral supplement may include an elevated amount of the ingredient component. The amount of the ingredient component in the mineral supplement may vary widely. For example, depending on the embodiment, the mineral supplement may include at least about 50 wt. %, desirably at least about 65 wt. %, suitably at least about 70 wt. %, further at least 75 wt.%, or yet even further at least 80 wt. %, at least about 85 wt. %, at least about 90 wt. % or at least about 95 wt.% of the ingredient component. In many situations, it is desirable to maximize the amount of the ingredient component in the mineral supplement.

The elemental minerals and /or mineral compounds (salts, carbonates, chlorides, hydroxides, oxides, phosphates, and organic chelates) may be provided using any of number of mineral sources. In general, any GRAS (generally recognized as safe) mineral source may be used which provides a bioavailable mineral sources.

Table 4. Shows some examples of suitable mineral sources

Calcium acetate	Disodium phosphate	Manganese sulfate
Calcium carbonate	Disodium selenite,	Monocalcium phosphate
Calcium chloride	Ethylenediamine dihydroiodide	Monosodium phosphate
Calcium gluconate	Ferrous fumarate	Potassium bicarbonate
Calcium hydroxide	Iron ammonium citrate	Potassium carbonate
Calcium iodate	Iron carbonate	Potassium chloride
Calcium iodobehenate	Iron chloride	Potassium iodate
Calcium oxide	Iron gluconate	Potassium iodide
Calcium sulfate	Iron oxide	Potassium sulfate
Cobalt acetate	Iron phosphate	Sodium chloride
Cobalt carbonate	Iron pyrophosphate	Sodium bicarbonate
Cobalt chloride	Iron sulphate	Sodium iodate
Cobalt oxide	Reduced iron	Sodium iodide
Cobalt sulfate	Magnesium acetate	Sodium selanate
Copper carbonate,	Magnesium carbonate,	Sodium sulfate
Copper chloride,	Magnesium oxide	Sodium thiosulphate
Copper gluconate,	Magnesium sulfate	Sodium tripolyphosphate,
Copper hydroxide,	Manganese acetate,	Sulfur
Copper orthophosphate,	Manganese carbonate,	Thymol iodide,
Copper oxide,	Manganese chloride,	Tricalcium phosphate,
Copper pyrophosphate,	Manganese citrate(soluble),	Zinc acetate,
Copper sulfate,	Manganese gluconate,	Zinc carbonate,
Cuprous iodide,	Manganese orthophosphate,	Zinc chloride,
Dicalcium phosphate	Manganese oxide	Zinc oxide,
Diidosalicylic acid	Manganese hosphate(dibasic)	Zinc sulfate

Table 5. Invention Formulations (All units are in wt. %)

Macrominerals	ISI&NDDB wt.%	A(AMR)	Range%	B(NEB)	Range%
Calcium	20%Min	7.57	6-23%	10.93	20-25%
Phosphorus	12%min	5.92	5-12%	3.38	5-12%
Magnesium	5% min	----------		6.68	5-10%
Iron	0.4% min	0.23	0.23-0.4%	0.23	0.23-0.4%
Sulfur	1.8-3.0%ISI/ 0.5%NDDB Na2S2O3	1.07	0.07-3.0%	1.07	0.07-3.0%
Zinc	0.80%min	1.01	0.012-0.80%	1.01	0.012-0.80%
Manganese	0.012% min	0.012	0.012-0.12%	0.012	0.012-0.12%
Iodine(as KI)	0.012%min	0.012	0.012-0.26%	0.012	0.012-0.26%
Copper	0.12%min	0.05	0.05-0.77%	0.05	0.05-0.77%
Cobalt	0.012%min	0.001	0.01-.012%	0.009	0.009-.012%
Selenium	0.001%	0.001	0.001-0.030%	0.001	0.001-0.030%
Sodium(sodium Chloride)		13.0	8-20%	10.93	5-15%
Nitrogen(NPN)		15.3	10-20%	8.57	5-12%

The mineral source /non-protein nitrogen source combination may include at least about 60-70 wt. % of the mineral source based on total combination weight. The mineral source may comprise a calcium source and salt (NaCl). The mineral supplement may comprise about 40 to 70 wt. % of the mineral source, about 10-50 wt. % non-protein nitrogen source; and about 3 to 10 wt. % of the hydrophobic component. The mineral source may comprise at least one of a calcium source, a sodium salt, a potassium salt, a phosphate source, a sulfur source, and a magnesium source. The mineral source may also comprise at least one of an iron source, a copper source, a cobalt source, a manganese source, a zinc source and a selenium source. The mineral supplement may further comprise binder. The binder may comprise bentonite, gum, lignin sulfonate, sodium silicate, attapulgite clay, calcium aluminates, or a mixture thereof. The mineral supplement may also comprise filler. The filler may comprise wheat middlings, soya hulls, corn gluten meal, dried distillers grains, ground grains (e.g., corn, wheat, milo) or mixture thereof. The filler may also comprise cotyledon fiber, hull fiber, root vegetables fiber, bran fiber, or a combination thereof. The filler may comprise wheat middlings, oilseed hull material, oilseed meal or combination thereof. The animal feed supplement may comprise the pelleted/densified mineral supplement.

According to another embodiment, a pelleted/densified mineral supplement comprises: at least about 70% of the combination of non-protein nitrogen source and a mineral source; and at least about 1 wt. % of a high melting hydrophobic substance having a melting point of at least of about 60^0C. The mineral supplement may comprise at least about 80 wt. % of the mineral source/non-protein nitrogen source combination. The mineral supplement may comprise about 3 to 10 wt. % of a hydrophobic component, which includes the high melting hydrophobic substance. The mineral supplement may comprise at least about 1 wt. % fatty acid material having melting point of at least about 60^0C. The mineral supplement may comprise at least about 1 wt. % hydrogenated triglyceride material having a melting point of at least about 60^0C.The hydrogenated triglyceride material may be partially hydrogenated, fully hydrogenated triglycerides, hydrogenated oilseed oil material may be soybean, cotton seed , sunflower, safflower, palm, corn oils, or a mixture thereof. The mineral supplement may comprise a hydrophobic component, which includes the high melting hydrophobic substance. The hydrophobic component may comprise a partially hydrogenated vegetable oil, which has a melting point no more than 50^0C, commonly 40-50^0C. The mineral source may comprise at least one of a calcium source, a phosphate source and salt (NaCl). The mineral source may comprise at least one of a calcium source, magnesium source, or phosphorous source. The high melting hydrophobic substance may comprise saturated fatty acid

having 14 to 22 carbon atoms. The high melting hydrophobic substance may comprise strearic acid, palmitic acid, or a mixture thereof. The mineral supplement may comprise about 1 wt. % to 5 wt. % of high melting hydrophobic substance. The hydrophobic component may include a triglyceride material having a melting point of about 40°C to 50°C. The high melting hydrophobic substance may comprise fatty acid material having a melting point of at least about 60°C.The mineral supplement may further comprise a binder. The mineral supplement may further comprise filler.

Miscellaneous other materials may also be included in mineral supplement as an aid in forming and processing the supplement blend into the mineral supplement or to target a specific nutritional/ health need of the animal. For example, calcium hydroxide may be added to the supplement blend to aid processing and forming of the mineral supplement.

A method for making the mineral supplement is described. The ingredient component and the hydrophobic component may be combined together to form a supplemental blend. The supplement blend may be a variety of dry and/or wet materials used to make the mineral component. The supplement blend may further processed to form the mineral supplement by forcing the supplement blend through an orifice and dividing into the pellets/densified to blocks/ lick blocks by any known process. This may be done, for example, by either an extrusion/pelletizing/densification process. The mineral supplement may be cooled and/ or dried.

Some of the elemental minerals /mineral compounds that may be provided in the ingredient component are as shown in the table 6. Table 6 shows the range that various elemental minerals and /or mineral compounds may commonly be present in the mineral supplement. It should be understood that the range are listed as elemental minerals and/or mineral compounds, and the actual amount of the mineral source for the elemental minerals and /or mineral compounds varies depending on the desired concentration of the elemental mineral and /or mineral compound in the subsequent and the particular mineral source(s) employed to produce the supplement. Also, the amounts shown in the table 6 represent those amounts of the elemental mineral and /or mineral compound that would be present in the mineral supplement. Thus, the amount of the mineral source used to provide the amount of the elemental mineral and/or mineral compound may be higher. While particular mineral supplement commonly includes more than one of the elemental

minerals and/or mineral compound listed in table 6, it need not and routinely does not include all of the mineral nutrients (elemental mineral and mineral compound).

Table 6. (B) All mineral composition

Elemental Mineral/Mineral compound	Amounts (B) %
Calcium	10.93
Phosphorus	3.38
Sodium(sodium Chloride)	10.69
Magnesium	6.68
Zinc	0.6-0.8
Iron	0.3-0.4
Copper	0.078-0.1
Cobalt	0.009-0.012
Iodine	0.02-0.026
Manganese	0.1-0.12
Selenium	0.001
Sulfur	1.4-3.00
NPN	8.87

As shown in the table 6, the ingredient component may include sources of major minerals such as calcium, phosphorous, salt, potassium, and magnesium as well as sources of trace minerals such as Zinc, Iron, Copper, Cobalt, Barium, Iodine, Manganese, Molybdenum, and Selenium. In one embodiment, the mineral supplement may include no more than about 5 wt. % of trace minerals. It should be understood, that an individual mineral source may serve as source for one or more elemental minerals and/or mineral compound listed in above table 6.

EXAMPLES:

Although the invention has been described in detail in the foregoing for the purpose of illustration, it is to be under stood that such detail is solely for that purpose and that variations can be made therein by those skilled in the art Without departing from the spirit and scope of the invention except as it may be limited by the claims.

The invention is now described with following non-limiting working examples.

Formulation A: The non-protein nitrogen source and salt (NaCl) combination may include at least about **50-60** wt. % of the mineral source based on total combination weight.

Trials from six are almost same in the treatment of inflammatory diseases.

Table 7. (A) Mineral/source (All quantities are in wt.%).

Substances	1	2	3	4	5	6
DCP	10	10	10	10	9.073	8.91
Salt (Nacl)	10	10	9.04	8.87	10	10
NPN(Urea)	10	10	10	10	10	10
TMS	0.38	0.45	0.38	0.45	0.38	0.45

Table 8. (A) All mineral composition

Composition	1	2	3	4	5	6
Ca	7.57	7.55	7.82	7.85	7.09	6.98
P	5.92	5.9	6.12	6.14	5.55	5.46
Na(NaCl)	13.03	13.0	12.17	11.98	13.45	13.49
N(NPN)	15.34	15.30	15.84	15.90	15.82	15.87
TMS	0.0125	0.0147	0.0129	0.015	0.0129	0.0152

Formulation B: Mineral source **(54.37 wt.%):**Non-protein nitrogen source **Urea (18.63 wt.%):** Salt (**NaCl) (27 wt. %).**

Table 9. (B) Mineral/source (All quantities are in wt.%)

Minerals/source Ingredients	Amount wt (wt.%)
Dicalcium phosphate	4.298 (18.78)
Lime stone powder	4.55 (19.87)
Magnesium oxide	1.884 (8.23)
Magnesium sulfate	2.250(9.83)
Trace minerals	0.120 (0.520)
Salt (NaCl)	5.80 (27.00)
N(non-protein nitrogen	4.0 (18.63)

Mineral source and non-protein nitrogen=73 wt.%

Mineral source and salt (NaCl)= 81.37 wt.%

Non –protein nitrogen source and salt (NaCl)=45.63 wt.%

Less 5% moisture= mineral source 54.37wt.%; Salt 27. Wt.%; Urea 18.63wt.%=100.00

Table 10. TMS (Trace Minerals) compositions

Trace minerals	wt% table 7,8 trial 1,3,5 and table 9	Wt Table7,8 trial 2,4,6
Copper	0.078	0.1
Iodine	0.02	0.026
Iron	0.3	0.4
Manganese	0.009	0.012
Selenium	0.001	0.003
Sulfur	1.4	3.0
Zinc	0.64	0.84

From the Figures 1 to 3 it is very clear that Formula B is mainly used for the control of negative energy balance like ketosis etc at the regular to prevent the metabolic disorder and the formula A is mainly used here for the treatment of inflammatory diseases like mastitis , metritis complex and pyelonephritis etc.

In general either A or B 50 gm taken and is mixed with approximately 1000 gm of the concentrate (crushed grin mix, de-oiled cakes independently or mix) and mixed properly is a ready to use feed supplement nutrient when soaked in water / or in dry condition even for storage for further use when as required. If necessary extra fillers may be used as are mentioned.

Further, it is advisable to mix binding agent, hydrophobic fully and or partially hydrogenated oils as mentioned above lit for the manufacture of pellets or densified blocks for commercial production.

There are two formulation products for the effective management periparturient inflammatory diseases can be prevented by maintaining the positive energy balance and ketosis.

This formulation products either A/ B are used as freshly prepared by mixing with concentrate only or ready to use in the form of lick bricks, pellets or industrial feed concentrate.

FORMULATION A: THIS IS ONLY SEVEN DAY FEEDING

1. Treatment of inflammatory diseases of uterine, kidney (for inflammatory complex diseases such as pyelonephritis cystitis, cervicitis, metritis complex (endometritis, pyometra, pneumovaginitis etc), and mastitis .

50 gm of this formulation product mixed with 1.0 kg concentrate (as this acts as diluents, energy source and taste modifier) if necessary in association with binding agents in dry conditions and mixed properly for uniform distribution and molasses etc sweetening agents like. This ratio of the product is feed to the animal daily two to three times daily in divided doses depending upon the body condition score of scale 1-5 or 1-10. For 1-2 in 1-5 point BCS/and or 1-4 in 1-10 point scale is feed three times daily whereas above 4 and 2 point BCS this range may be feed two times daily.

For the treatment of inflammatory productive & reproductive diseases in broad view (inflammatory complex diseases such as cystitis, cervicitis, metritis ,endometritis, pyometra pnemovaginitis, mastitis, and kidney disease as described earlier for seven days, and observe the clear uterine discharge from uterus/ vagina and good quality milk etc and the animal is getting improved the

health with increased daily dry matter intake and milk improved milk yield. Once the clear discharge or regular good quality milk is obtained it is clear indication of infection i.e. cleared.

2. Prevention of inflammatory diseases of uterine, kidney (for inflammatory complex diseases such as cystitis, cervicitis, metritis complex (endometritis, pyometra etc), and mastitis.

Immediately post parturition: 50 gm of this formulation product mixed with 1.0 kg concentrate (as this acts as diluents, energy source and taste modifier) if necessary in association with binding agents in dry conditions and mixed properly for uniform distribution and molasses etc sweetening agents like. This ratio of the product is feed to the animal daily two-three times daily in divided doses depending upon the body condition score of scale 1-5 or 1-10. For 1-2 in 1-5 point BCS/and or 1-4 in 1-10 point scale is feed three times daily whereas above 4 and 2 point BCS this range may be feed two times daily.

FORMULATION B: For regular feeding to sequel and enhance immunity and control metabolic disorders after treatment.

1. **Prevention of negative energy balance and ketoacidosis during productive and transition state or lactating state.**

50 gm of this formulation product mixed with 1.0 kg concentrate (as this acts as diluents, energy source and taste modifier) if necessary in association with binding agents in dry conditions and mixed properly for uniform distribution and molasses etc sweetening agents like. This ratio of the product is feed to the animal daily two-three times daily in divided doses depending upon the body condition score of scale 1-5 or 1-10. For 1-2 in 1-5 point BCS/and or 1-4 in 1-10 point scale is feed three times daily whereas above 4 and 2 point BCS this range may be feed two times daily.

2. Sequel and corrective majors after treatment of inflammatory complex diseases.

50 gm of this formulation product mixed with 1.0 kg concentrate (as this acts as diluents, energy source and taste modifier) if necessary in association with binding agents in dry conditions and mixed properly for uniform distribution and molasses etc sweetening agents like. This ratio of the product is feed to the animal daily two-three times daily in divided doses depending upon the body condition score of scale 1-5 or 1-10. For 1-2 in 1-5 point BCS/and or 1-4 in 1-10 point BCS is feed three times daily whereas above 4 and 2 point BCS this range may be feed two times daily.

This helps in correcting the negative energy balance and improving the self cure innate immunity for invading microbes from the environment. As it is sell known fact that microbes play important role in plant, human and veterinary field. Microbes are either symbiotic or opportunistic pathogens. Opportunistic pathogenic micro-organisms during negative energy state (immunosuppressive) multiply and colonize and release the endotoxins which are crucial for metabolic disorders/physiological conditions at this state. This formula is for controlling this total sequence of mechanism.

Positive points after clearing the inflammatory disease with A and controlling the negative energy balance i.e. metabolic disorder with formula B for 30-45 days the uterine system is well compromised and ready to reproduction. Lactating livestock are estrus synchronized by using naturally formulated nutritional and or hormonal estrus synchronization and natural mating or inseminated twice in 24 hrs for better results. There is 95-96% conception rate without affecting milk yield.

Clinical cure was defined as the complete absence of any **clinical mastitis/metritis** sign on both post treatment sampling days; presence of any sign was considered a clinical failure.

BRIEF DESCRIPTION OF THE FIGURES/DIAGRAMS

Figure. 1 Oral treatment/prevention of uterine infections (metritis complex)

Figure 2. Diagram of treatment of inflammatory uterine infections metritis complex monitoring

Figure 3. Diagram of treatment of inflammatory mastitis complex monitoring.

I Claim,

1. Dietary compositions as mineral supplements to control infections and metabolic disorders in livestock comprising: 40 to 70 wt% mineral salts, 10 to 50 wt% non-protein nitrogen source and 10 to 30 wt% of salt (NaCl).

2. Composition as claimed in claim 1 further comprising hydrophobic component, binder and fillers.

3. Composition as claimed in claim 1 wherein the mineral salts include major minerals selected from calcium, potassium, phosphorous, sulfur and magnesium.

4. Composition as claimed in claim 1 wherein the mineral salts include trace minerals selected from trace minerals from Zinc, Iron, Copper, Cobalt, Barium, Iodine, Manganese, Molybdenum, and Selenium.

5. Composition as claimed in claim 1 wherein composition is having 5 to 10 wt% calcium, 3 to 8 wt% phosphorous, 10 to 20 wt% salt (NaCl), 12 to 18 wt% non-protein nitrogen source and 0.01 to 0.025 wt% of trace mineral elements mixture.

6. Composition as claimed in claim 5 wherein trace mineral elements in the mixture are selected from copper, iodine, iron, manganese, selenium, sulfur and zinc.

7. Composition as claimed in claim 1 wherein composition is having 50 to 60 wt% of mineral salts, 15 to 20 wt% of non-protein nitrogen source and 25 to 30 wt% of salt (NaCl).

8. Composition as claimed in any of the preceding claims wherein the non-protein nitrogen source selected is urea.

9. Animal feed compositions to control infections and metabolic disorders in livestock comprising: 2 to 10 wt% of mineral supplements composition as claimed in any of the claims 1 to 6 and 90 to 98 wt% of the concentrated feed.

10. Method for preparation of dietary compositions as mineral supplements to control infections and metabolic disorders in livestock comprising: (a) blending of 40 to 70 wt% mineral salts, 10 to 50 wt% non-protein nitrogen source and 10 to 30 wt% of salt (NaCl) to form the ingredient component;
    (b) Combining mineral salts blend obtained in step (a) with hydrophobic component to form a supplemental blend;
    (c) Processing the supplemental blend obtained in step (b) by forcing through an orifice and dividing into the pellets/densified to blocks/ lick blocks;
    (d) The mineral supplement obtained in step (c) is cooled and/ or dried to use as the mineral supplement in dietary compositions.
11. Method as claimed in claim 10 wherein the mineral salts include major minerals selected from calcium, potassium, phosphorous, sulfur and magnesium.
12. Method as claimed in claim 10 wherein the mineral salts include trace minerals selected from trace minerals from Zinc, Iron, Copper, Cobalt, Barium, Iodine, Manganese, Molybdenum, and Selenium.
13. Method as claimed in claim 10 wherein the non-protein nitrogen source selected is urea.

14. Method of prevention and/or treatment of inflammatory diseases of uterine, kidney and mastitis comprising: feeding 2 to 10 wt% of mineral supplements product as claimed in any of the claim 1 or 4 by mixing with 90 to 98 wt% of the concentrated feed to the livestock daily two to three times daily in divided doses depending upon the body condition score of scale 1-5 or 1-10 and for 1-2 in 1-5 point BCS/and or 1-4 in 1-10 point scale is feed three times daily whereas above 4 and 2 point BCS this range feed two times daily.

15. Method of prevention of negative energy balance and ketoacidosis during productive and transition state or lactating state and/or sequel and corrective majors after treatment of inflammatory complex diseases comprising: feeding 2 to 10 wt% of mineral supplements product as claimed in any of the claim 1 or 5 by mixing with 90 to 98 wt% of the concentrated feed to the livestock daily two to three times daily in divided doses depending upon the body condition score of scale 1-5 or 1-10 and for 1-2 in 1-5 point BCS/and or 1-4 in 1-10 point scale is feed three times daily whereas above 4 and 2 point BCS this range feed two times daily.

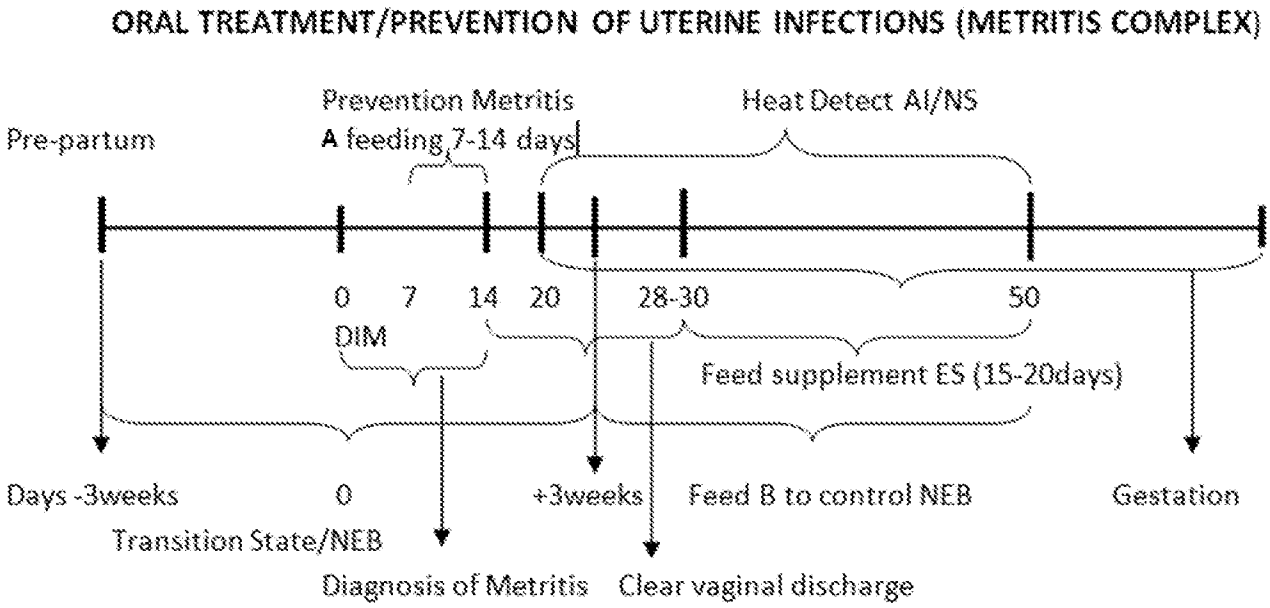

Fig. 1

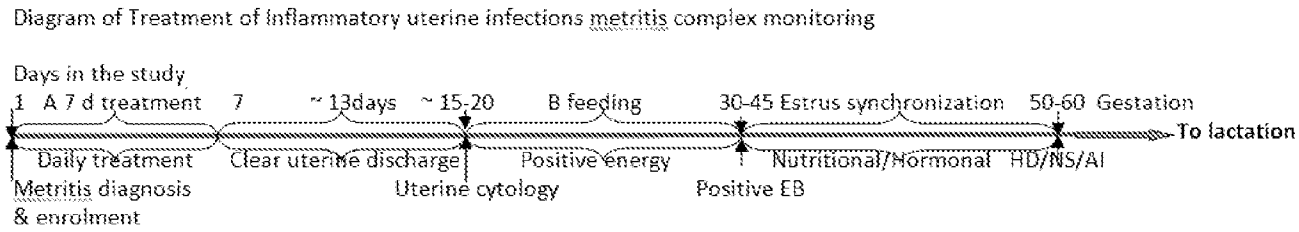

Fig. 2

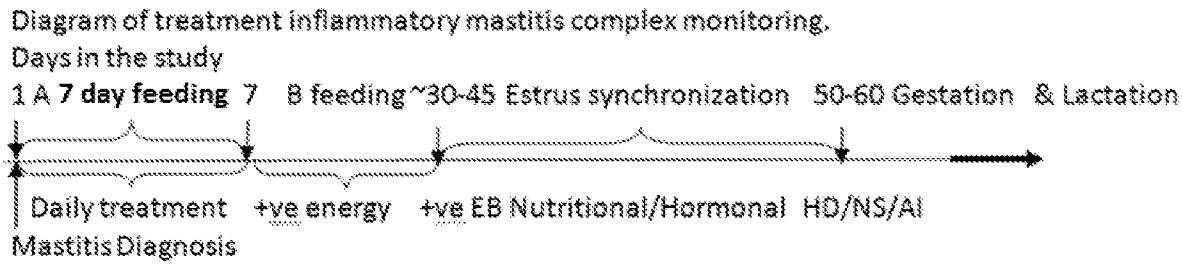

Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2016/057730

A. CLASSIFICATION OF SUBJECT MATTER
A23K10/00,A23K20/20 Version=2017.01

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A23K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Patseer, IPO Internal Database

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN1810146A (AOQIAN WANG) 02.08.2006 (2 August, 2006). abstract, claims	1-13
Y	JPH104888A (NORIN SUISANSYO KOKUSAI NORIN) 13.01.1998 (13 January, 1998). abstract	1-13
Y	US4335116A (UNIVERSITY PATENTS INC) 15.06.1982 (15 June, 1982). abstract, claim 1	1-13

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
03-02-2017	03-02-2017
Name and mailing address of the ISA/ Indian Patent Office Plot No.32, Sector 14,Dwarka,New Delhi-110075 Facsimile No.	Authorized officer Sandhya Kothari Telephone No. +91-1125300200

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2016/057730

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 14, 15
because they relate to subject matter not required to be searched by this Authority, namely:
•The subject matter of claims 14 and 15 of the present application relates to a method for treatment of animal body by therapy, which constitutes an excluded subject matter and therefore is not required to be searched and examined by this authority under PCT Article 17(2)(a)(i) and Rule 39.1(iv).

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.