

Product:
Penergetic Udder Care

User application report

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Efficacy of Penergetic-t on Health and production status of cross-bred cows

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Introduction

General health of cattle depends on various conditions like nutrition, management and fodder quality etc. For optimum milk production, a cow should be necessarily having a healthy constitution. For this purpose it should be provided with good quality of hay straw and other dry matter with a good quality concentrate in proper proportion. In spite of this adequate food quality and quantity, it may not get fully metabolized for several reasons. For this purpose many products that increase the digestibility are in the market with moderate to poor efficacy.

1. The fodder does not get properly digested and the traces of straws and feed could be noticed in the dung.
2. Due to poor fat digestibility, the hair coat also will not be shiny.
3. Due to partial digestion and growth of unwanted bacteria, the dung will have bad smell which will hinder the clean milk production.

A novel approach to overcome these problems, are a requirement of the present era. Similarly mastitis is a threatening disease to the dairy animals which causes severe economic loss.

To overcome these problems a new feed additive called Penergetic-t (made in Switzerland) was suggested and was taken up for experiments. It is claimed that this product with calcium carbonate as a base material was produced by imparting in to it the properties of herbs, minerals and trace elements. It was claimed to set right various problems of health as referred in the preamble of this report. Hence a systematic study was undertaken to evaluate the efficacy of the product Penergetic-t and Penergetic-t mastitis on various condition of dairy cattle.

It is normally believed that micro and macro minerals are very important in maintaining the health and production status of the cows. Many of these minerals are not only essential for maintaining the production of the cattle, but also very essential for regular body function of the cow (master and White, 1996). Penergetic-t was claimed as a unique formula, combining

elemental properties of beneficial herbs in addition to minerals and trace elements, being extracted in calcium carbonate (CaCO₃) as a bas material.

Mastitis is found commonly in two forms i.e. acute and chronic. The first one becomes apparent and can easily be diagnosed. Milk becomes abnormal, from appearance of flakes or clots to garget and quarters get swollen and become sensitive. However, it is difficult to diagnose and treat sup clinical or chronic mastitis. The milk appears to be normal. Bacteria usually, but not always, can be isolated in milk. Milk yield is depressed and composition may be altered. Sub clinical mastitis may become clinical or acute. Good udder health is essential for quality milk production and somatic cell count is the most widely accepted criterion for indicating the udder health status of a dairy herd (Mark et al., 2002).

Material and Methods

The present experiment was conducted in Composite Livestock Farm, Hesaraghatta, Bangalore, for general performance of the animals including milk yield. Along with this, the efficacy of the PENERGETIC-t on chronic mastitis, was conducted in University Dairy Farm, Hebbal, Bangalore.

The cows were divided into 9 groups as per the condition observed and deformities. Following categories were made and treated accordingly with PENERGETIC-t and PENERGETIC-t mastitis. The feeding, watering, environment and maintenance were uniform to all the cows in control and experimental groups in both farms. The experiment was conducted during the month June to September 2005.

All the animals were fed with hay, green grass and concentrated feed. Water was given ad libitum to all the groups.

No other medication or supportive therapies were used during the trial period.

Sl. No.	Group	Condition of the selected animals	Dose
1.	Group I	Control group	2 g of plain CaCO ₃ was given mixed in feed.
2.	Group II	Cows with low milk yield	PENERGETIC-t 2 g / animal once in a day for 90 days
3.	Group III	Cows with poor growth	
4.	Group IV	Cows with dull hair coat and alopecia	
5.	Group V	Cows with generalized weakness	
6.	Group VI	Cows with low SNF (solids not fat) and low fat content	
7.	Group VII	Cows with improper fibre digestion (loose stool, stunted growth and low milk yield)	
8.	Group VIII	Cows with foul smelling dung	
9.	Group IX	Cows with chronic mastitis by history or lab tests	PENERGETIC-t mastitis 2 g for oral use & 5 g with petroleum gel for external application

Group 1-8: 5 cows Group 9: 15 cows

The experiment was conducted as follows:

1. The cows in Group II were selected after 40 days of calving and considering their milk yield in the previous lactation within 3rd or 4th lactation.
2. Various changes in body conditions, body weight, milk yield, SNF, fat content etc. Were recorded in both control and experimental group.
3. Fibre digestibility test was conducted in cows before and once in a 15 days during the therapy
4. Blood was collected for major organ function tests, haematology and serology which are indicative of function of vital organs like kidney, liver, spleen and body defence

mechanism. Blood was collected from all the animals once in two weeks, up to 14 weeks of the experiment.

5. These tests were conducted before the trail and once in a 10 days followed by once in 20 days during the trail.
6. Urine analysis, faecal fibres content and rumen pH test were conducted in all cows.
7. In the cows suspected for mastitis, culture and sensitivity test, spot mastitis diagnostic tests like strip the / pH paper test was done before the trail and once in 10 days during the trail.
8. Somatic cell counts were determined to diagnose mastitis and effect of Penergetic-t mastitis in therapy of such cases.
9. Any other improvements other than the expected were also to be noted and recorded.
10. Cows with chronic mastitis were administered the Penergetic-t mastitis at the rate of 2 g per day orally in diluted form in water and mixed with feed and it was also applied locally after mixing in white petroleum gel at the ratio of 5 g of Penergetic-t mastitis with 50 g of gel (being divide into 2 portions and applied two times a day with gentle massaging of udder).
11. All the cows in Group II and VIII were given Penergetic-t once in a day by soaking it overnight in water and mixing it with the feed next day, while control group (group I) animals were given plain calcium carbonate at the rate of 2 g per day during entire experiment.

All the clinical signs of recovery, improvement and adverse effect were closely monitored, video graphed, photographed and documented.

The analysis of the samples was done in National Institute of Nutrition & Physiology, Bangalore and also in Veterinary College Hebbal, Bangalore.

In Group IX cows with the chronic mastitis were diagnosed on history, clinical signs, strip tests and based on somatic cell count.

Penergetic-t and Penergetic-t mastitis were administered in both the groups at the rate of 2 g per day in general category and at the rate of 2 g per day per animal for mastitis by soaking the material over night in water (1 or 2 lt.) and mixing the said water in the feed / fodder next day (once in a day). It was given for 14 weeks.

The recovery from the disease was noticed by clinical and laboratory findings.

The data obtained from the entire experiments were statistically analysed by one way ANOVA (Snedecor and Cochran, 1980) using GraphPad Prism, Trail version 4.01 for Windows, GraphPad Software, San Diego California USA, WWW.graphpad.com.

Results and discussions

In the present study, the plain calcium carbonate was given to the cows in control group, since this is the major expedient used in the preparation of the product to find the expedient has any role in the therapy.

Penergetic-t administration in experimental group gradually increased the milk yield in 13 week of therapy (table 1).

The animals in group III which had poor growth showed increase in body weight and increase in appetite after the end of the therapy (table 2).

Stean et al. (2006) observed that feeding of propionibacteria to cows increased the milk yield, food intake and body condition. In the present study similar finding was observed, which may be attributed to the orexigenic ingredients in Penergetic-t.

Cows in group IV had dull hair coat and alopecia. After six weeks onwards of the therapy, they developed new glistening hair coats.

Cows in group V with generalized weakness, improved health condition after 5 weeks of administration of Penergetic-t. Dry matter intake of the cows was markedly increased.

The SNF of the milk of the cows was checked daily in group VI in which there was consistent low SNF which was less than 8.5. During the treatment period, after 9 weeks the SNF was increased significantly ($P < 0.05$). The SNF level was consistent even after withdrawal of the therapy. There was gradual and consistent increase in the fat content in the milk during the treatment period (table 3). This may be due to better fibres digestion and proper utilization of concentrates (Rao and Sundaresan, 1980).

In the group VII cows the fibre digestion was less which was observed by passing of undigested fibre threads in the dung. This markedly decreased after 5 weeks of onset of the therapy.

In the group VIII with foul smelling dung, Penergetic-t could markedly decrease the smell after 3 weeks of onset of the therapy which may be attributed to the ability of the dung to reduce the unwanted bacterial load from the gastrointestinal tract or better digestion.

In all groups Penergetic-t could increase the concentration of haemoglobin significantly ($P < 0.05$). However there was no change in the parameters like red blood cells (RBC), packed cell volume (PCV), clotting time, total leucocyte count (TLC), lymphocytes, neutrophils, eosinophils, basophils and monocytes before and after the treatment (table 4).

There was no marked change in the serum biochemical parameters like serum creatinine, blood urea nitrogen (BUN), aspartate aminotransferase (AST) and alanine aminotransferase (ALT) indicating that Penergetic-t is not nephrotoxic or hepatotoxic even after 14 weeks of administration (table 5)

There was no marked change in the concentrations of serum calcium, phosphorus, magnesium and potassium (table 6).

There was no change in any parameters in the calcium carbonate treated group when compared to the week 1 values (table 8) indicating that calcium carbonate do not have any beneficial or harmful effects and it did not interfere with the results. This indicated that beneficial effects of Penergetic-t were attributed to the active principles in it and not due to calcium carbonate.

In group IX cows in which the chronic mastitis which was diagnosed by clinical examination and laboratory tests, the somatic cells gradually decreased from week 1 of the therapy to week 6 of the therapy (table 7). This finding is in accordance with Stein et al (2006). Hence the Penergetic-t mastitis is useful to treat chronic mastitis. It may be effective in combination of antibiotics and supportive therapy.

There was no change in urine pH and rumen pH of all the animals during the entire period of the experiment when compared to the control group.

In the group IX cows lesions in the hoof which were difficult to heal were observed. These wounds were difficult to get healed and were existing since many months. Interestingly in 12 cows out of 15 cows the wound healed during the course of the therapy when compared to the rest of the cows in the herd. Hence a systematic research in this regard is needed.

Conclusion

Penergetic-t is found to be quite helpful in improving the general health condition of the milking cows. It increased the milk yield not fat, fibre digestibility, body weight and hair coat condition. It cured the dermatitis, within two weeks and reduced the foul smell of the dung of the animals improved the haemoglobin content and general health of the cows. It was proved to be efficient to cure chronic mastitis. However further research is required for the role of individual ingredient of the product and their role in the beneficial effect of the product. It was proved to be non-toxic to animals during long term therapy. The role of the individual ingredients of the product in curing the foot lesions has to be explored.

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Table 1: Milk yield of cows after the therapy with PENERGETIC-t at group II cows

Weeks	Milk yield (litres / day)
0	9.95 +/- 1.1
1	10.3 +/- 1.2
2	11.3 +/- 0.8
3	12.3 +/- 1.2
4	13.3 +/- 1.2
5	14.3 +/- 0.9
6	14.8 +/- 1.2
7	14.9 +/- 1.2
8	14.9 +/- 1.5
9	14.3 +/- 1.6
10	14.3 +/- 1.3
11	15.0 +/- 1.2
12	15.3 +/- 0.8*
13	15.4 +/- 0.6*

N = 6, *P < 0.05 Values are expressed as mean +/- SE

Table 2: Body weight of the cows at group treated with PENERGETIC-t

Weeks	Body weight (kg)
0	344.4 +/- 10.2
1	348.2 +/- 12.1
2	349.5 +/- 8.2
3	358.7 +/- 11.3
4	342.9 +/- 11.3
5	347.8 +/- 10.4
6	349.9 +/- 8.2
7	351.7 +/- 7.8
8	352.9 +/- 8.1
9	355.8 +/- 9.1
10	368.9 +/- 7.9
11	369.8 +/- 8.8
12	371.1 +/- 8.2*
13	373.2 +/- 6.8*

N = 6, *P < 0.05 Values are expressed as mean +/- SE

Table 3: SNF and fat content at group VI cows

Weeks	SNF (%)	Fat (%)
0	7.1 +/- 0.8	3.5 +/- 0.4
1	7.5 +/- 0.6	3.5 +/- 0.3
2	7.4 +/- 0.7	3.6 +/- 0.5
3	7.8 +/- 0.8	3.6 +/- 0.6
4	7.6 +/- 0.7	3.7 +/- 0.4
5	7.7 +/- 0.6	3.8 +/- 0.3
6	7.5 +/- 0.5	3.9 +/- 0.4
7	7.7 +/- 0.5	3.9 +/- 0.5
8	7.8 +/- 0.9	4.1 +/- 0.5
9	8.1 +/- 0.9*	4.1 +/- 0.4
10	8.3 +/- 0.8*	4.1 +/- 0.2
11	8.9 +/- 0.5*	4.3 +/- 0.5
12	8.8 +/- 0.6*	4.3 +/- 0.4
13	8.6 +/- 0.8*	4.4 +/- 0.4

*P < 0.5 Values are expressed as mean +/- SE

Table 4: Haematological parameters of cows treated with Penergetic-t

Haematological parameters	Week 1	Week 2	Week 4	Week 6	Week 10
RBC ($10^3 / \text{mm}^3$)	8.17 +/- 1.14	8.21 +/- 1.14	8.72 +/- 1.12	8.21 +/- 1.04	8.28 +/- 1.04
Hb (g %)	11.2 +/- 1.26	12.1 +/- 1.4	12.2 +/- 1.12	13.2 +/- 0.18*	14.2 +/- 0.15*
PCV (%)	21.9 +/- 4.14	21.7 +/- 4.15	24.7 +/- 4.12	28.5 +/- 8.17	25.4 +/- 5.19
Clotting Time (min.)	2.1 +/- 0.12	2.5 +/- 0.13	1.8 +/- 0.02	1.1 +/- 0.03	0.66 +/- 0.02
TLC ($10^3 / \text{mm}^3$)	7.86 +/- 1.82	8.11 +/- 1.42	8.36 +/- 1.62	8.26 +/- 1.48	8.36 +/- 1.67
Lymphocytes (%)	78.5 +/- 3.26	81.26 +/- 1.72	82.15 +/- 1.33	88.6 +/- 4.26	83.28 +/- 5.34
Neutrophils (%)	15.6 +/- 1.21	16.28 +/- 1.82	16.31 +/- 1.66	19.29 +/- 4.82	18.33 +/- 1.57
Eosinophils (%)	1.35 +/- 0.11	1.45 +/- 0.22	1.30 +/- 0.21	1.94 +/- 0.67	1.67 +/- 0.76
Basophils (%)	0.15 +/- 0.21	0.14 +/- 0.22	0.11 +/- 0.34	0.21 +/- 0.12	0.19 +/- 0.39
Monocytes (%)	0.04 +/- 0.16	0.02 +/- 0.24	0.08 +/- 0.24	0.09 +/- 0.21	0.09 +/- 0.28

*P < 0.5 Values are expressed as mean +/- SE

Table 5: The blood serum chemistry in all groups

Week	Creatinine (mg/dl)	BUN (mg/dl)	Bilirubin (mg/dl)	AST (u/l)	ALT (u/l)	Glucose (mg/dl)
1	0.89 +/- 0.09	7.9 +/- 0.46	0.61 +/- 0.06	35.4 +/- 2.1	20.2 +/- 2.12	77.8 +/- 4.2
2	1.00 +/- 0.09	8.5 +/- 0.13	0.78 +/- 0.16	40.3 +/- 1.9	22.2 +/- 2.22	66.2 +/- 2.4
3	1.19 +/- 0.09	7.7 +/- 0.83	0.69 +/- 0.13	40.9 +/- 3.2	22.2 +/- 2.22	79.5 +/- 3.4
4	0.98 +/- 0.09	8.7 +/- 1.03	0.85 +/- 0.12	46.1 +/- 2.1	23.2 +/- 2.23	65.3 +/- 4.1
5	0.78 +/- 0.09	6.6 +/- 0.43	0.55 +/- 0.16	47.5 +/- 2.3	22.2 +/- 1.28	78.3 +/- 3.5
6	0.79 +/- 0.09	9.2 +/- 0.53	0.58 +/- 0.21	35.4 +/- 3.4	24.2 +/- 2.26	76.1 +/- 5.4
7	0.90 +/- 0.09	8.2 +/- 1.04	0.75 +/- 0.23	40.3 +/- 4.6	26.2 +/- 2.25	75.2 +/- 3.4
8	0.98 +/- 0.09	9.2 +/- 1.02	0.78 +/- 0.24	40.9 +/- 2.2	23.2 +/- 2.22	97.3 +/- 5.6
9	0.79 +/- 0.09	8.5 +/- 0.94	0.78 +/- 0.08	37.7 +/- 2.6	26.2 +/- 2.29	89.3 +/- 6.4
10	1.10 +/- 0.09	9.6 +/- 0.23	0.78 +/- 0.09	43.2 +/- 2.1	27.2 +/- 2.29	97.3 +/- 9.4
11	1.10 +/- 0.09	9.7 +/- 0.23	0.98 +/- 0.10	41.8 +/- 2.1	28.2 +/- 2.24	84.3 +/- 8.4
12	1.09 +/- 0.09	9.6 +/- 1.03	0.88 +/- 0.17	51.2 +/- 1.9	24.2 +/- 2.23	63.3 +/- 4.7
13	1.10 +/- 0.06	8.6 +/- 1.03	0.99 +/- 0.24	44.7 +/- 2.1	26.2 +/- 2.26	82.3 +/- 5.6
14	1.10 +/- 0.08	7.96 +/- 0.94	0.89 +/- 0.26	37.7 +/- 3.6	25.2 +/- 2.23	79.3 +/- 5.4

Table 6: The serum mineral concentrations in all groups of cows

Week	Calcium (mg/dl)	Phosphorus (mg/dl)	Magnesium (mg/dl)	Potassium (mg/dl)
1	8.7 +/- 0.25	7.34 +/- 0.76	2.5 +/- 0.12	4.6 +/- 0.10
2	8.2 +/- 0.46	8.33 +/- 0.87	2.6 +/- 0.24	4.8 +/- 0.18
3	8.6 +/- 0.49	8.34 +/- 0.66	2.8 +/- 0.12	4.7 +/- 0.19
4	8.7 +/- 0.54	7.59 +/- 0.98	2.6 +/- 0.24	4.6 +/- 0.23
5	8.9 +/- 0.64	7.68 +/- 0.56	2.5 +/- 0.12	4.1 +/- 0.14
6	9.7 +/- 0.87	7.67 +/- 0.76	2.7 +/- 0.24	4.5 +/- 0.13
7	8.5 +/- 0.67	7.45 +/- 0.79	2.5 +/- 0.12	4.8 +/- 0.12
8	8.4 +/- 0.43	7.56 +/- 0.78	2.3 +/- 0.24	4.7 +/- 0.23
9	8.7 +/- 0.76	7.68 +/- 0.71	2.5 +/- 0.12	4.6 +/- 0.12
10	8.5 +/- 0.68	7.65 +/- 0.53	2.9 +/- 0.24	4.1 +/- 0.19
11	8.9 +/- 0.78	8.67 +/- 0.67	2.5 +/- 0.12	4.5 +/- 0.17
12	7.99 +/- 0.35	7.99 +/- 0.32	2.6 +/- 0.24	4.5 +/- 0.16
13	8.1 +/- 0.63	7.89 +/- 0.53	2.5 +/- 0.12	4.8 +/- 0.26
14	8.4 +/- 0.56	7.23 +/- 0.65	2.6 +/- 0.25	4.7 +/- 0.21

Table 7: Somatic cell counts at group IX cows

Week	Somatic cell count (x 10 ⁶)
0	4.35 +/- 1.7
1	4.10 +/- 1.2
2	3.88 +/- 1.8
3	3.55 +/- 1.2
4	3.32 +/- 1.1
5	3.20 +/- 0.9
6	3.02 +/- 1.2
7	2.97 +/- 1.5
8	2.67 +/- 1.3
9	2.32 +/- 1.6
10	2.28 +/- 1.4

**Table 8: The values of various parameters in the control group animals
(Calcium Carbonate treated)**

Week	Milk yield (litres/ day)	Body weight (kg)	SNF (%)	Fat (%)	Hb (g%)	Calcium (mg/dl)	Phosphorus (mg/dl)	Creatinine (mg/dl)	AST (u/l)
1	9.3 +/- 1.7	334.2 +/- 12.1	7.5 +/- 0.6	3.5 +/- 0.7	11.1 +/- 1.3	8.2 +/- 0.26	8.11 +/- 0.7	1.1 +/- 0.09	39.5 +/- 3.2
2	10.3 +/- 0.8	337.5 +/- 13.2	7.4 +/- 0.7	3.5 +/- 0.6	11.2 +/- 1.4	8.1 +/- 0.47	8.4 +/- 0.8	1.00 +/- 0.08	37.3 +/- 2.5
3	11.3 +/- 1.5	336.7 +/- 10.6	7.8 +/- 0.8	3.6 +/- 0.5	11.4 +/- 2.1	8.8 +/- 0.50	8.3 +/- 0.7	1.10 +/- 0.07	40.1 +/- 4.6
4	11.4 +/- 1.6	342.9 +/- 11.3	7.6 +/- 0.7	3.5 +/- 0.8	11.2 +/- 2.6	8.7 +/- 0.55	7.9 +/- 0.9	0.9 +/- 0.08	44.1 +/- 3.1
5	12.3 +/- 1.0	347.8 +/- 10.4	7.7 +/- 0.6	3.3 +/- 0.7	12.1 +/- 2.4	8.8 +/- 0.67	7.8 +/- 0.6	1.1 +/- 0.08	42.5 +/- 3.3
6	11.8 +/- 1.2	349.9 +/- 8.2	7.5 +/- 0.5	3.6 +/- 0.2	11.2 +/- 1.26	9.1 +/- 0.86	7.5 +/- 0.7	1.2 +/- 0.1	39.8 +/- 3.7
7	9.8 +/- 1.8	351.7 +/- 7.8	7.7 +/- 0.5	3.7 +/- 0.9	11.1 +/- 1.4	8.6 +/- 0.69	7.5 +/- 0.8	1.1 +/- 0.2	40.4 +/- 3.8
8	11.9 +/- 1.9	352.9 +/- 8.1	7.8 +/- 0.9	3.8 +/- 0.4	11.2 +/- 1.26	8.3 +/- 0.48	7.9 +/- 0.7	1.2 +/- 0.2	40.9 +/- 2.7
9	12.3 +/- 1.8	355.8 +/- 9.1	8.1 +/- 0.9	3.9 +/- 0.5	12.1 +/- 1.4	8.5 +/- 0.79	7.5 +/- 0.5	1.5 +/- 0.3	38.7 +/- 2.5
10	10.3 +/- 1.5	368.9 +/- 7.9	8.3 +/- 0.8	3.6 +/- 0.4	11.2 +/- 1.26	8.6 +/- 0.68	7.6 +/- 0.5	1.4 +/- 0.4	41.2 +/- 1.2
11	11.0 +/- 1.4	369.8 +/- 8.8	8.9 +/- 0.5	3.8 +/- 0.3	12.1 +/- 1.6	8.7 +/- 0.69	8.1 +/- 0.7	1.1 +/- 0.3	39.8 +/- 2.4
12	11.4 +/- 0.9	371.1 +/- 8.2	8.8 +/- 0.6	3.9 +/- 0.7	11.2 +/- 1.26	8.1 +/- 1.1	7.9 +/- 0.8	1.2 +/- 0.2	40.2 +/- 1.7
13	9.4 +/- 0.7	373.2 +/- 6.8	7.8 +/- 0.8	3.7 +/- 0.2	11.7 +/- 1.7	8.1 +/- 0.76	7.8 +/- 0.6	1.1 +/- 0.3	41.5 +/- 4.3
14	10.4 +/- 0.8	334.8 +/- 9.4	7.9 +/- 0.9	3.9 +/- 0.5	11.7 +/- 1.3	8.4 +/- 0.56	7.2 +/- 0.1	1.4 +/- 0.6	39.9 +/- 2.7

Table 9: Cured hoofs



Cured hoof wound after treatment



Pictures of the cows

