



राष्ट्रीय डेरी अनुसन्धान संस्थान  
NATIONAL DAIRY RESEARCH INSTITUTE

(मान्य विश्वविद्यालय)

(Deemed University)

(भारतीय कृषि अनुसन्धान परिषद्)

(Indian Council of Agricultural Research)

करनाल (हरियाणा) भारत KARNAL-132001 (Haryana) India



F.No. 199 -

Dated: 20.11.96

Mr. Raymond A Page  
DIRECTOR  
PS Australian Promotions Pty Ltd.,  
MAGNETIC TECHNOLOGY,  
14 CADDY PLACE, PO Box 864,  
Frankston, Victoria 3199, AUSTRALIA

Dear Mr. Page,

I am enclosing one copy of the reprint of our research article on "MAGNETIC TREATMENT FOR SCALE REDUCTION IN HEAT EXCHANGER" by V.P. Aneja and G.S. Rajorhia which has been published in the J.Dairyinig, Foods & Home Sci.,14(4): 171-180, 1995. This research article is based on our extensive work on Magnets you had supplied in the year-1990.

In September, 1996 the trials were conducted on commercial evaporators maintained by the Punjab Milk Producers Federation Plant at Bhatinda. The results of the investigations were so much encouraging that the Head of the Division of that Company desired to install Magnets of higher strength in their plant.

In view of the interest being expressed by the Indian Dairy Industry, this research on high strength Magnets needs to be pursued.

I shall therefore feel obliged for suggesting further course of action in this regard.

Hope you and your family are in the best of health.

With kind regards,

Yours sincerely,

*G.S. Rajorhia*  
(G.S. RAJORHIA) 20.11.96

CC:

Karnal

Professor V.P. Aneja, Dairy Engineering Division, NDRI,

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*J. Dairying, Foods & Home Sci.*, 14 (4) : 171-180, 1995.

## MAGNETIC TREATMENT FOR SCALE REDUCTION IN HEAT EXCHANGER

**V.P. Aneja and G.S. Rajorhia**

National Dairy Research Institute, Karnal-132 001 (Haryana), India

### ABSTRACT

Detailed investigations were conducted to obtain fundamental information on the variation in heat transfer rates on account of scale formation in a tubular heat exchanger during processing of buffalo whole milk with and without magnetic treatment. Milk solids deposition was profoundly influenced by flow rates of milk as well as by forewarming temperature. With magnets, the percent increases in overall heat transfer coefficient were 10.3, 3.8 and 2.7 at the flow rates of 150, 250 and 350 lit/hr. respectively in comparison with the untreated milk. The percent increase in overall heat transfer coefficient at 70, 75 and 85°C forewarming temperatures were 4.2, 1.9 and 1.15. With magnetic treatment, there was considerable reduction in scale deposition, thus improving the capacity of exchanger, reducing the maintenance schedule period and also maintenance cost.

Full report available on request – not on web due to file size.

Email: [reports@scale-x.com](mailto:reports@scale-x.com)