

## **LET US CONVERT IMPOSSIBLE IN TO POSSIBLE THROUGH PROFESSIONAL INNOVATIONS.**

India is one among top ten resource rich countries on this globe but in terms of material prosperity and quality of life related to basic human needs we significantly lag behind as compared to developed nations. Keeping in view the present status of our country, every citizen including those in power tend to feel that it is nearly impossible to remove the curse of poverty, generate sustainable employment for all, control inflation and weed out corruption from its very roots.

Inspired by unique achievements and exemplary contribution of Dr. V. Kurien father of white revolution in India and following his footprints, our Mission has conceived and prepared evolutionary dairy development plan to upgrade status of our motherland from No.1 milk producing country to No.1 milk exporting nation. Our plan is unique in the sense that it incorporates sound visionary concepts and features like Zero defect, Zero effect, Made for India and virtually needs no direct investment by Government. Implementation of our plan envisages only regulatory and statutory support from Government of India (within the framework of existing statutory laws and regulations).

We would like to humbly request premier dairy institutions of India to professionally debate and evaluate “Threats and Weaknesses” of our dairy industry being highlighted in this presentation so that we may resolve all critical core issues and convert “impossible in to possible” while riding on our unique strengths and availing global opportunities knocking on our door. Prudent dairy professionals of India, by using their collective professional wisdom and expertise can easily address age old unresolved complex problems for making significant contribution in removing poverty, generating sustainable employment through effective and transparent management of dairy business operations.

### **EVOLUTIONARY DAIRY DEVELOPMENT MISSION PLAN:**

Under prevalent field conditions in India is it possible:

- 1 To procure on commercial scale pure buffalo, cow or mixed raw milk meeting with international quality requirements for purity of contents and microbiological safety?
2. Process and market that milk as pasteurized milk having shelf life 2/3 weeks under refrigeration and sterilised milk having shelf life more than one year at room temperature using innovative green processing technology/solar or biogas energy /recyclable packaging materials/C to C marketing?
3. Reduce total milk handling costs from “cow to consumer” by nearly 50% from prevalent levels?

If you are an ethical dairy business entrepreneur or professional C.E.O. of a dairy company/institution in India and your answer to above questions is “NO” or “IMPOSSIBLE” then please carefully go through our Mission presentation:

### **“Hidden losses in milk purchase transactions and trigonometry of milk purchase in India”**

Most of the advanced dairy countries have only cows and dairy plants purchase cow milk for which specified standard is 3.50% fat, 8.50% S.N.F, 12.00 % total milk solids and 88% natural water content. Specific gravity of standard cow milk corresponds to corrected lactometer reading (C. L. R.) as 30 (S. N. F.

to Fat ratio  $8.5/3.5=2.4285714$ ). Freezing point of milk of this composition is measured and calibrated using cryoscopy. Refract-meter index reading recorded during milk testing indicates % dilution with added water accurately.

Similarly, standard for buffalo milk in India is 6.50% fat, 8.84 % S.N.F, 15.34% total milk solids, and 84.66% natural water content. Specific gravity of standard buffalo milk corresponds to 29. C. L. R. S.N.F. to Fat ratio in standard buffalo milk is much different than cow milk ( $8.84/6.50=1.36$ ).

Obviously freezing point, refract-meter index reading and net worth of raw milk (B.M or C.M. per Kg.) varies considerably from each other.

Authentic formulae evolved by professional scientists, decades ago for purchasing buffalo milk and cow milk now being used for milk billing calculations in India is known as 60:40 two axis formulae. It is C.L.R based formulae that gives arithmetically correct results up to decimal points provided all milk purchase transactions from milk producer to dairy plant are regulated and monitored on C.L.R. basis accurately without (M.A.D.) Manipulation, Adulteration or Dilution.

Specified milk rate is declared for standard buffalo milk in Rupees /Kg. Fat say Rupees 600/Kg. Fat and value of liquid milk is worked out by giving 60% weightage to fat and 40% to S.N.F. ( $600 \times 6.5 = \text{Rupees } 3900$  per 100 Kg. milk or Rs.39/Kg for standard buffalo milk)

On 60:40 basis Fat price in buffalo milk works out as  $(39 \times 0.60 / 6.5) \times 100 = 360/\text{Kg}$ .

Similarly S.N.F price becomes  $(39 \times 0.40 / 8.84) \times 100 = \text{Rs. } 176.4705882354/\text{Kg}$ .

These prices become bench mark prices for Fat and S.N.F on dry matter basis for any kind of raw milk (B.M., C.M or mixed milk in any proportion) without any modification or manipulation in milk composition or change in natural S.N.F to Fat ratio.

As per 60:40 two axis milk purchase system milk containing 5.00% or more fat is treated as buffalo milk and paid @ Rs.600/Kg Fat in milk provided S.N.F: Fat ratio is not modified and C.L.R. remains more than 29. Likewise, milk containing more than 3.50% to 5.00% Fat is treated as cow milk provided S.N.F: Fat ratio is not modified and C.L.R. remains more than 30. Under Indian conditions accurate testing of S.N.F. content for each milk purchase transaction is time consuming and cumbersome process so buffalo milk containing fat% between 5.0 to 8.0 was purchased (assuming average C.L.R. as 29 or more for freshly calved and late lactation animals) and milk payment is released by simply multiplying fat% with basic specified rate (Rs.600/Kg Fat). Milk containing 5.0 % Fat will be paid Rs.30/kg ( $5 \times 600 / 100 = 30$ ), 8.0 % fat Rs.48/Kg. ( $8 \times 600 / 100 = 48$ ) and standard buffalo milk with 6.50% fat Rs.39/Kg ( $6.5 \times 600 / 100$ ). {Gross average of 5 % Fat and 8% Fat corresponds to standard buffalo milk 6.50% ( $(\text{Rs. } 30 + 48) / 2 = \text{Rs. } 39/\text{Kg}$ )}.

This conventional practice is still continuing at village level milk collection centres (especially in milk cooperative sector) causing abnormally high hidden loss in milk purchase transactions due to dilution and manipulation of mixed milk composition. If the seller takes out some quantity of milk out of standard buffalo milk, adds same quantity of water in that milk resultant fat % can be manipulated as mixed milk containing cow milk (equivalent to added water as diluent). Even otherwise milk billing

record can be manipulated by increasing or decreasing the quantities in milk purchase transactions (Morning and evening milk collection). Mixed milk reaching the dairy plants especially in north India indicate that mixed raw milk contains 50% cow milk or more whereas calculated % of cow milk in that milk is not more than 30%. Difference in cow milk % i.e. 20 % added water thus becomes milk and gets paid as milk causing abnormally high hidden loss to concerned dairy plant.

Fat content in milk (fresh calving) is relatively low as compared to near dry period in all species of dairy animals but average gross fat % of buffalo milk is normally not less than 6.50% and C.L.R is not lower than 29, Similarly gross average fat of cow milk is normally not less than 3.50% and C.L.R. not less than 30. Obviously if cow milk is mixed with buffalo milk in any proportion then C.L.R. of mixed milk should normally remain between 29 and 30 provided no manipulation takes place and Fat: S.N.F ratio is neither modified by addition or extraction from either cow milk or buffalo milk nor by dry mixing or skimming.

When commercial dairy plants were set up in India cow milk and buffalo milk was purchased separately even by multinational companies like Nestle India and milk billing (C. L. R. basis) was carefully regulated and monitored. Adulteration in milk was only added water and the same was adequately penalised using 60:40 two axis formulae for purchasing raw milk indicated below (proportionate S.N.F deduction was applied for C.L.R. lower than specified standards.)

$$S. N. F. \% = C.L.R./4 + 0.2 \times \text{Fat} + C.L.R./100$$

$$S.N.F. \text{ of Standard buffalo milk} = 29/4 + 0.2 \times 6.5 + 29/100 = 8.84\%$$

$$S.N.F. \text{ of Standard Cow milk} = 30/4 + 0.2 \times 3.5 + 30/100 = 8.50\%$$

$$S.N.F. \text{ of Standard mixed milk (50\% B.M.+50\% C. M.)} = 29.5/4 + 0.2 \times 5.0 + 29.5/100 = 8.67\%$$

$$S.N.F. \text{ of Standard mixed milk (75\% B.M.+25\% C. M.)} = 29.25/4 + 0.2 \times 5.75 + 29.25/100 = 8.755\%$$

$$S.N.F. \text{ of Standard mixed milk (25\% B.M.+ 75\% C. M.)} = 29.75/4 + 0.2 \times 4.25 + 29.75/100 = 8.585\%$$

### **Why are we purchasing manipulated, adulterated or diluted raw milk?**

When cow milk is mixed with buffalo milk in any proportion and mixed milk is diluted with added water then it is not possible to accurately analyse net worth of mixed milk without digital hydro analysis. Digital analytical technique (D.A.T.) is the only method that can accurately analyse exact % of cow milk, % of added water and net worth of mixed milk reaching dairy plants. During milk purchase transactions we test % of fat content in milk only volumetrically and not gravimetrically so digital hydro analysis becomes essential prerequisite for procuring pure undiluted raw milk in India and other countries where milk is purchased using 60:40 two axis formulae.

In order to discourage manipulation of diluted buffalo milk and its conversion as additional cow milk in mixed milk, **empirical formulae** mentioned below was evolved for evaluating value of cow milk component by dairy professionals and the same is being used by dairy plants for mixed milk purchase ( B.M & C.M) especially when mixed milk is transported from village collection centre to dairy plant and

milk bills are prepared on the basis of primary milk purchase record (as per indicated quantities of B.M & C.M).

Fat value of cow milk = Specified per kg fat rate for buffalo milk/2 = Rs. 600/2=Rs.300/Kg fat

S.N.F Value of cow milk= Specified per Kg. fat rate for buffalo milk/3 = Rs.600/2=Rs.200/Kg. S.N.F.

Milk billing and payment system based on such empirical formulae offers relatively lower price to pure cow milk as compared to actually due as per accurate 60:40 formulae based on price of Fat Kg. and S.N.F. Kg. on dry matter basis for B.M., C.M., or mixed milk of any composition.

100 Kg standard cow milk = {Rs.(3.50x300)+(8.50x200)/100}=Rs27.50/Kg.( as per empirical formulae)

100 Kg standard cow milk = {Rs.(3.50x360)+(8.50x176.470588235)/100}=Rs27.599999999/Kg. ( \*)

Difference= Rs. (27.599999999-27.50)=Rs.0.099999999/Kg (less than actually due)

100 Kg cow milk 30 C.L.R.= {Rs.(5.0x300)+(8.80x200)/100}=Rs32.60/Kg.(as per empirical formulae)

100 Kg cow milk 30 C.L.R. = {Rs.(5.0x360)+(8.80x176.470588235)/100}=Rs33.529411764 /Kg. ( \*)

Difference= Rs. (33.529411764-32.60) = Rs. 0.929411764/Kg. (less than actually due)

( \*) 60:40 two axis formulae on dry matter basis).

### **“Trigonometry of milk purchase transactions in India”**

While purchasing raw milk normally we test only Fat% (volumetrically not gravimetrically) so if C.L.R. is not measured and S.N.F.is not calculated with prescribed formulae for each milk purchase transaction from milk producer to dairy plant then purchaser is likely to suffer hidden loss due to multiple C.L.R. based equations for fat% of manipulated mixed milk reaching dairy plant as follows:

Let us assume that fat % of mixed milk reaching dairy plant is 5.75% ,5.00% or 4.25%

If 25% cow milk is mixed with 75% buffalo milk without any dilution with added water then mixed milk will have 5.75% Fat, 8.755% S.N.F. 14.505% total milk solids but only one C.L.R. i.e. 29.25.

However, if 5.75% Fat milk is prepared by diluting standard buffalo milk with 13.04347826 Kg. added water then C.L.R. of that milk would be 25.653846154 and calculated S.N.F. as 7.82 (not 8.755%)

If 5.75% Fat milk is prepared from (50% B.M +50% C.M) then C.L.R. of that milk would be 33.925 and calculated S.N.F. 9.9705% (not 8.755%)

If 5.75% fat milk is prepared by concentrating standard cow milk (evaporating natural water content) then C.L.R. of that milk would be 49.2857142855 and S.N.F.13.9642857142% (not 8.755%)

Similarly, there would be three C. L. R.'s for each % of Fat like 5.00%, 4.25% or any other permutation or combination.

These permutations and combinations would obviously make milk purchase transactions very complicated and simple arithmetical equations would become trigonometrically complex calculations for arriving at due milk payments for every combination of Fat, S.N.F and total milk solids corresponding to specific C.L.R. of mixed milk.

### **What is Manipulation by dilution?**

Experimental explanation:

Let us assume that we take out 10 Kg. milk out of 100 Kg. standard buffalo milk containing 6.50% fat , 8.84% S.N.F. ( 29 C.L.R.) and add 10 Kg water in that milk. Resultant milk thus becomes 100 Kg. Now take out another 10 Kg milk out of that diluted manipulated milk and add 10 Kg. water to make it 100 Kg once again.

Standard buffalo milk contained 15.34 total milk solids and (84.66 Kg. natural water originally) but now mixed manipulated milk contains 20 Kg. added water. Although diluted/manipulated milk does not contain any cow milk but unethical manipulators indicate in milk bills that it contains 20% cow milk. Hidden loss on this account can only be eliminated and controlled if the quantity of milk remains unaltered and all milk purchase transactions are carried out using digital analytical technique with accurate C.L.R. measurement. Due milk payments be released using 60:40 two axis formulae besides due counter verification of fat (Kg.) and S.N.F. (Kg.) actually reaching dairy plants (**with bench mark prices of Fat and S.N.F. on dry matter basis**).

Our Mission associates in India and Canada have professional experts capable of providing live demonstration that even under the conditions now prevailing in India we can easily:

- 1 procure on commercial scale pure buffalo, cow or mixed raw milk meeting with international quality requirements for purity of contents and microbiological safety without any hidden loss in milk purchase transactions due to manipulation, adulteration or dilution with added water.
2. Process and market that milk as pasteurized milk having shelf life 2/3 weeks under refrigeration and sterilised milk having shelf life more than one year at room temperature using innovative green processing technology/solar-biogas energy /recyclable packaging materials/C to C marketing.
3. Reduce total milk handling costs from “cow to consumer” by nearly 50% from prevalent levels.

For more details and documentary /video evidence on this subject please visit our website <http://apnidairy.com/> . You may download “dairy business management software’ (Free) available on our website to control hidden loss in milk purchase transactions. you may also communicate with us on our email address [iuhumber@gmail.com](mailto:iuhumber@gmail.com) and ask for a copy of our presentation titled “DOODH KA DOODH AUR PANI KA PANI” and recently conducted case study of a premier dairy institution in India suffering hidden loss of more than Rupees one crore per day only due to dilution and manipulation (assuming no adulteration except added water used for dilution and manipulation).

Our Mission associate in India, Innovative Business Improvements Private Limited is offering prize of rupees one lac to any dairy professional working for commercial dairy plant in India who would like to contest and prove that our claims and contentions mentioned here in these presentations are arithmetically incorrect, scientifically not logical as per 60: 40 two axis formulae being used by one and all for preparing milk bills and releasing milk payments to milk producers.

With kind regards

(Jaswant Singh Bhandair)

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P.S. Your valuable professional comments on our presentations would be highly appreciated and gratefully acknowledged