Rural adaptation of Multi Nutrient Feed Block Technology

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80% of people in Rajasthan depend on Agriculture and Animal husbandry for their livelihood, which includes most of the SC & ST families. In this state 62 percent of total geographical area in this state is under dry desert (12 western districts), where livestock rearing is the main stay of rural economy. As per the result of census 2001, out of the total working population of 2.38 crores, 1.57 crore workers are engaged in agriculture and livestock. After agriculture, animal husbandry is the mainstay of livelihood of people in rural areas. As per the 1999 cattle census, total livestock in the state is 5.44 crores. Rajasthan has 5% of the human population in the country but it's cattle population is 11% and it's livestock population is 20.57% of the entire cattle/livestock population of the country. It is imperative that the valuable animal assets are maintained. An animal genetic resource with a wide variety of indigenous cattle breeds in Rajasthan has valuable the indigenous cattle breeds have evolved over generations to adapt to the local agro-climatic and socio-economic needs of the people. These indigenous breeds of cattle are now subjected to fast genetic degradation and dilution because of unplanned feeding and grazing. Feeding of livestock had been a challenging job in western zone of Rajasthan where persistent severe famine and droughts result in poor animal health and reduced milk production due to non-availability of green feed/fodders. Under these circumstances it is imperative to improve and conserve these valuable germplasm by proper feeding and nutrition. In these parts of Rajasthan in dry times especially during May -June feed/fodder and water became scarce;

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several farmers left their animals to feed for themselves, which led to death in hunger.

In experimental trials on MNFB at institute as well as at farmers' field proved very beneficial in providing balanced nutrition to livestock. Based on these results CAZRI institute initiated transferring this technology to livestock owners, as a result of which MNFB became very popular in nearby villages. It became impossible for the institute to fulfill the MNFB requirement of livestock owners of Pali district and other regions of the state; then it was decided why not to train the livestock rearers of rural community for MNFB production .keeping the above fact in mind KVK-Pali organized many demonstrations/ Kisan goshtis and trainings on balanced feeding of livestock (feeding of MNFB and urea treated straw), improvement of available pastures etc. under "Strategy to Combat Drought Situation". Under this programme, CAZRI's KVK Scientists engaged in livestock extension activities taught the farmers about advantages of feeding MNFB/nutrient mixture and training programme to be conducted on preparation of MNFB by farmers themselves. The innovative farmers readily agreed for training; hence one 6-day "On-campus" training was organized at KVK–Pali in collaboration with Head Quarter (MNFB Production Unit, CAZRI-Jodhpur) in which fifteen livestock farmers participated. In the training the farmers were taught different aspects of MNFB, how to prepare, what the ingredients are, what their proportion of mixing is and where we can get the ingredients. After gaining training, 4 – 5 young rural farmers became impatient for starting MNFB production. Among them one young farmer Sh. Deda Ram Patel (of village-Gajangarh, tehsil-Rohat, District -Pali) started the MNFB production unit sincerely and with great enthusiasm. Presently, Sh. Deda Ram is not only earning Rs 8000 to 10,000/month from self-employment but also providing balanced feed to the livestock of his region. Sh. Patel's success had become a success story for the nation and abroad. Director CAZRI, Many scientists, dignitaries, experts, QRT-team, NGOs and group of trainees from various departments and an Ethiopian delegation has also visited this village to practically see the successful transfer of CAZRI technology. This product has become very

popular among livestock farmers in Pali district and is in great demand, as this farmer is receiving demands from other districts of Rajasthan and adjoining states. Another two livestock farmers (from Artia and Sonaimanji villages) have also started MNFB-units on same lines. Thus, CAZRI technology is flourishing in nearby villages and other livestock farmers are also learning how to prepare the MNFB/nutrient mixture. Above events clearly speak about successful extension, popularity and viability of our institute's MNFB technology in self-employment. Above events clearly speak about successful extension, popularity and viability of our institute's technology in self-employment.

What is MNFB

MNFB is a mixture of wheat bran, yellow soybean, molasses, urea, dolomite, guar-gum, mineral mixture, common salt, urea and water mixed in a definite proportion. Ingredients thoroughly mixed, pressed in hydraulic machine and dried in solar drier gives out MNFB. It provides fat, minerals and salts when fed to livestock. It improves digestion, increase milk production, animals come into heat regularly, feed cost is reduced and also animal health is improved.

Fig 1 : Feeding animals on MNFB

The MNFB consists of five basic components i.e energy source, nitrogen source, mineral source, structural component and binder.

I. ENERGY SOURCES

Molasses: **Sugarcane** or **sugar beet**, which ever is available, can be used for feed block production but cane molasses is better than the beet molasses. In place of molasses, cattle feed grade **jaggery** can also be used.

II. NITROGEN SOURCES

1. **Non-protein nitrogenous source:** Fertilizer grade, granular urea can be used.
2. **Vegetable or true protein:** Any de-oiled seed cake or meal can be used. De-oiled soybean seed meal is the best choice but instead of that *til* cake, *guar* meal etc., can also be used.

III. MINERAL SOURCES

1. Common salt: Any type of powdered, common salt can be used in preparation of feed block.

2. Mineral mixture: Vitamin-mineral mixture, containing vitamin A, D3, E, and lysine and methionine amino acids, is the best for block production. Alternatively, mineral mixture containing calcium and phosphorus, and fortified with vitamin A can also be used.

3. Dolomite: It is a complex of carbonates of calcium and magnesium. Alternatively, calcite can be used instead of dolomite.

IV. STRUCTURAL COMPONENTS

Wheat bran is best, as it not only provides structural stability to the block but also a rich source of structural and soluble carbohydrates, and also of B-complex vitamins. Wheat bran can be replaced by any of the following feed ingredients: (1) De-oiled rice bran (2) mixture of de-oiled rice bran and rice polishings (3) Malt sprouts (4) Bruised barley by-products, which is a mixture of barley bran and husk (5) mixture of rice polishings and *bajra* husk; dried powdered leaves of (6) *neem* (*Azadirachta indica*) (7) *ardu* (*Ailanthus excelsa*) etc.

V. BINDER

Several inorganic binders like cement, gypsum, bentonite, oxides of calcium and magnesium are in use as compact feed block binder. But farmer, in his formulations, use organic binder. Presently farmer is using a by-product of guar-gum industry or gum-dust as binding material.

I N G R E D I E N T S (8)

1. Molasses
2.1. Urea granules 2.2. Urea solution
3. Dolomite
4. Vitamin-mineral mixture
5. Guar gum dust

6. Guar *churi*
7. Common salt
8. Wheat bran 3+4+7. Mixture of salts

Other accessories

(i) Storage bins,
(ii) Balance or weighing scale,
(iii) Heating device: LPG gas/fuel-wood/coal stove or electric heater,
(iv) Wooden or iron moulds,
(v) Feed-block press machine: Hand operated screw type/foot press/Electric operated hydraulic block press
(vi) Dryer: Hybrid type solar-cum-electric/Solar dryer fitted with exhaust hood/hot air draft type electric oven/Industrial oven/Hot air blast type, diesel furnace-oven.

How to prepare the feed block as per farmer's technology

Fig 2: Stepwise preparation of MNFB

1. Weight 1.0 kg granular, fertilizer grade urea in glass or steel container and heat it with 500 ml (half litre) water, till it dissolves. Avoid over heating.
2. Pour this solution (I) While hot into a plastic tub containing 10.400 kg molasses, and mix with steel spoon

3. Prepare mixture of 1.0 kg common salt, 1.0 kg vitamin-mineral mixture, and 1.0 kg dolomitic lime or calcite.
4. Pour all-mineral mixture into urea-molasses solution and go on mixing till homogenous suspension of urea-molasses-mineral is obtained.
5. Take 7.400 kg wheat bran in a large sized plastic tub and add to it 0.500 kg de-oiled soybean meal or any oil-seed cake. Mix well
6. To this mixture, pour suspension of urea-molasses mineral ingredients (III), and mix all these contents till there is coating of (III), over the wheat bran-soya meal mixture.
7. At last, slowly, sprinkle 240 grams of guar gum dust over the above mixture (IV) and mix thoroughly all the ingredients.

Weigh 2.350 kg of above mixture. Transfer weighed mixture into the iron mould, and press the material with screw type hand press machine
Allow to keep the pressed material in the mould for 24 hours alternatively mixture can be pressed in wooden mould

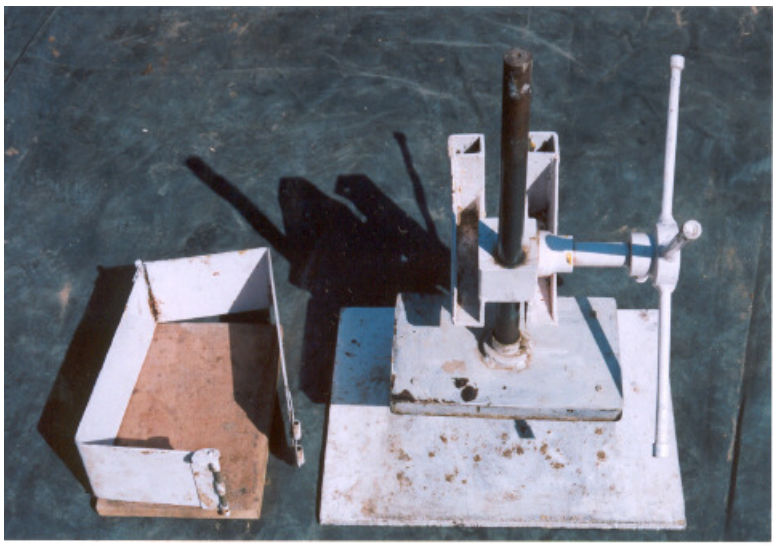

Fig 3: Collapsible Iron Mould & Screw-type Block Press Machine

Dry the pressed material (VI) in: Solar drier/Hybrid electric-cum-solar drier or non-draught or draught type industrial electric oven at 60-65°C, till it dries completely. The dried block should not contain more than 15% moisture.
Dried feed block can be packed in a printed-paper/polythene wrapper. Finally 10 blocks can be packed in a printed jute bag or a paper cartoon.