Dal Analogue – an Economic and Healthy Option from Soy to Bridge the Pulses Supply-Demand Gap

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India is the world's largest producer as well as importer of pulses, which are an important component of the Indian diet. Over the last 50 years pulses production has been stagnant which is leading to a decline in per capita consumption. This is resulting in a continuous increase of imports. During this period, domestic pulse prices have increased relative to other foods. In the last fifty years the growth in the pulses production has been less than 0.7% CAGR. The irony of the Indian pulses situation is that per capita consumption is almost half of what it was 50 years back. The alarming figures show that the per capita availability of pulses was about 27.3 kg in 1958-59 and in 2007-08 it was 13.9 kg.

In 2008 India imported about 25 lakh tons of pulses (about 15% of total pulses supply), which is growing steadily since 2000-01. Even with about 14% demand met through imports, there is still a tremendous gap in the demand and supply of pulses in India. This is evident with more than 150% increase in the prices of *dals* in the last five years and this situation may continue further. At the same time, lower middle-class and vulnerable segment of the population are getting deprived of the *dal*s from the basic "*dal*-roti" platter. The situation is already deteriorating as seen from the retailer's reports in the media that the frequency of purchase of *dal*s is going down. Based on the past pulses production situation and Indian population growth, it is estimated that India may have to import at least 36 lakh tons (about 20% of total pulses supply) of pulses by 2015 and 45 lakh tons (about 23% of total supply) by 2020. These imports may only provide pulses at the current per capita consumption. If we aim to increase the per capita consumption to a modest 18kg/year by 2015 we need to import 77 lakh tons and to increase it to 20kg/year in 2020 the imports would go up to 116 lakh tons.

Agronomical and breeding interventions could be a long term solution but looking at the current cropping pattern and diversification of land use to non-agricultural practices, it may take a very long time. Modern food processing methods offer an economic, nutritious and healthy alternate to this crisis without compromising the taste and food habits. Extrusion cooking, one of the versatile food processing technologies can be put to use to manufacture soy-based *dal* analogue using locally available raw materials.

Dal analogue is made from edible grade defatted soya flour, whole-wheat flour and turmeric powder. As *dal* analogue is made from in expensive raw materials, it is less than half the price of Tur *dal* to the consumers. *Dal* analogue has more than 30% protein which is more than 30% increase in protein

content compared to some of the traditional *dal*s like Tur, Moong and Chana. The quality of protein is superior to any of the *dal*s as this product has the typical combination of pulses and cereal. As far as cost of protein is concerned, protein cost from *dal* analogue is almost one third of protein from tur/moong/urad *dal*. Another unique characteristic of this product is it is very easy to cook. As it is a pre-cooked product it takes less than 10 minutes to cook on open flame compared to more than 25 minutes for other *dal*s. This characteristic is of utmost economic value especially in saving fuel costs during cooking for the mid-day meal programs. Also, this product can be a perfect vehicle for micronutrients fortification to combat deficiencies such as iron, zinc and vitamin A. Above all this product which has a good amount of protein from soy can certainly help in reducing certain diet related degenerative diseases like heart disease and osteoporosis.

About ten years back National Dairy Development Board (NDDB) installed Wenger's Twin-Screw Extruder with support from United Nations Development Program (UNDP) and started working on introducing *dal* analogue but could not succeed in making a dent in the market and discontinued its efforts. However, about two years back American Soybean Association and Wenger Manufacturing started working with NDDB to upgrade the *dal* analogue manufacturing technology. Using this upgraded process Reliance Retail (RR) conducted a consumer survey to evaluate the consumer acceptance of *dal* analogue. Based on the consumer survey, RR lunched *dal* analogue under *Strengthy Plus* brand name in the Mumbai market. Recently, NDDB started marketing *dal* analogue under the brand name i*dal* through their Safal outlets. Based on the market response of this product and increasing interest among various feeding program implementing agencies and stakeholders in the industry it is obvious that the there is a great scope for *dal* analogue in the Indian market. There are already a few feeding program implementing agencies which are using this product in their programs for a couple of years.

Based on the nutritional and economic benefits it can be recommended that *dal* analogue can be introduced in mass feeding programs, distributed to the vulnerable segments of the population and consumers in general. Introduction of *dal* analogue at affordable prices would certainly help in bringing down the prices of *dal*s and bridging the supply-demand gap in pulses significantly. Also, this will reduce the burden on the exchequer by reducing net pulses import and provide nutritional and health security to the Indian society.

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