



APRIL 1982

NEFI BULLETIN

Bulletin of the Nutrition Foundation of India

Nutrition in the New Twenty Point Programme

C. Gopalan

It is indeed gratifying that 'Nutrition' has found specific mention in the new Twenty Point Programme announced recently by the Prime Minister. The decision at the highest level to "accelerate programmes of welfare for women and children, and nutrition programmes for pregnant women, nursing mothers and children, specially in tribal, hill and backward areas" should not only provide a new impetus to the programmes for improving the nutritional status of our poor communities, but should also remove earlier misgivings that nutrition had not received adequate focus in our programmes of national development. Nutrition did not figure in the earlier Twenty Point Programme.

There are other items in the new Twenty Point Programme which will also contribute indirectly to the nutritional uplift of our poor income groups.

These are:

- special efforts to increase production of pulses and vegetable oil seeds;
- strengthening and expanding coverage of Integrated Rural Development and National Rural Employment Programmes;
- review and effective enforcement of minimum wages for agricultural labour;
- supply of drinking water to all problem villages;
- improving the environment of slums;
- promoting family planning, and

- augmenting primary health care facilities.

It is hoped that the announcement of the new Twenty Point Programme will be followed by the enunciation of a clear, coherent and realistic Integrated National Nutrition Programme (INNP), and the setting up of a machinery to ensure its successful implementation.

Earlier Experiences

It may be useful at this point to benefit from our earlier experience in the implementation of nutrition programmes. Some of our earlier errors may be realised in order that we may avoid them in future.

- The necessary social and political climate at the village level, necessary for the smooth implementation of programmes had not been generated. The community had not been prepared and community participation was taken for granted.
- An efficient infrastructure for the implementation of the programme at the field level was not created, and the managerial skill needed for successful implementation of social welfare programmes at the village level with imagination, resourcefulness, and concern and compassion for the poor was not specially requisitioned.
- In the absence of facilities for decentralised planning, a uniform inflexible, blanket approach had to be followed;

the programmes could not be tailored and adapted to suit the local conditions and requirements.

- There was no built-in provision for independent evaluation and monitoring, with the result that there was feedback from the field to the centre and no mid-course corrections were attempted. There was often a wide disparity between actual accomplishments in the field and official claims from the centre.

- Some of the programmes depended heavily on external support and subsidies, and indeed were even started because of the availability of such support.

- The inputs in the so-called 'pilot' programmes were so large that they could not be replicated on a country-wide scale.

- It was not recognised that nutrition programmes, however efficiently executed, cannot succeed in isolation but only when they are part of an all-round effort at socio-economic development and health care.

Suggestions for the Future

- In the development of future programmes and in the expansion of existing ones, *qualitative* considerations are, at least, as important as *quantitative* ones. We should not ensure our achievement by the extent of the coverage only but by the *quality* of the coverage as well. It is not only *many* blocks that are going to be covered but how *well* they will be covered should be the main consideration.
- It is necessary that due attention be paid to the building up of an efficient infrastructure for the implementation of the programme and nec-

managerial skill, if necessary even from outside the Government departments, must be requisitioned.

- An intensive educational and community-contact programme must precede the introduction of the programme in any block, and the adaptations necessary to suit local conditions and requirements must be decided upon by the district planning authority after due consultation with the community.
- The programmes should be based on national resources and self-reliance. Too much reliance on external support from foreign countries in such a vital field as health, nutrition and social welfare will be like building castles on quicksand. This is not to suggest that external help should not be availed of for the purpose of rapidly achieving self-reliance in critical areas where we may be deficient.
- The help of international agencies

like UNICEF and WHO (which are not 'foreign') should be fully availed of.

- At least five to ten percent of the total allocation for each programme may be earmarked for independent evaluation and monitoring. The governmental agencies conducting the programmes should be receptive not only to the success stories but also to reports highlighting deficiencies and failures. Necessary mid-course corrections must be injected and the programmes must be under constant and continuous review.

We understand that the Integrated Child Development Service (ICDS) programme will now be extended to cover 1,000 blocks instead of the present 400.

This expansion is welcome, but it will clearly involve all the challenges and considerations discussed above. This opportunity may be availed of to introduce appropriate modifications

in the ICDS programme, in the light of earlier experience.

It may also be useful to ensure that in the new blocks in which the programme is to be introduced, the full complement of staff envisaged as per the modified Primary Health Centre pattern is in position, rural employment programmes are instituted and effective functional links are established between the functionaries of these programmes in order to maximise their benefits through mutual reinforcement. Also, instead of insisting on a set uniform pattern in all the new blocks, it may be desirable to try out alternative strategies in order to evolve through experience the most rewarding and effective approach.

It is hoped that the national programmes for control of goitre, nutritional blindness and anaemia will all be similarly stepped up.

It is heartening to hear that following the Prime Minister's plea for periodic medical check-up of school children, the Health Ministry is now formulating a comprehensive school health service programme. It is hoped that this programme will be a plan as comprehensive as the one that we had pleaded for earlier in this Bulletin (Gopalan C.: Bull. Nutr. Found., Oct 1981).

The nutrition component of the current health system has to be considerably strengthened. It is in this context that we had pleaded for strengthening the nutrition programme in the health system with

- a comprehensive school-health service, and
- a health and nutrition service unit taken as part of the rural development programme (Gopalan C.: Bull. Nutr. Found., Jan. 1982).

All the above programmes together could constitute the Integrated National Nutrition Programme (INNP). Such a programme could be controlled, coordinated and monitored by a group under the chairmanship of the Prime Minister herself. Such an arrangement will provide coherence, and intersectoral coordination and also invest the whole effort (which is, in effect, the kingpin of the new Twenty Point programme) with the necessary administrative authority and political stature.

Subsequent to our writing the above paper, we have had the opportunity to study the "Report of the Task Force on School Health Services" prepared by the Health Ministry. The programme proposed by the Task Force is a pilot project limited to 30 primary Health Centre areas in different parts of the country. Even in these areas, the programme will not be on the comprehensive scale suggested earlier in this Bulletin. Though it is envisaged that the children will be "screened for malnutrition", apparently no specific provision for combating this major problem is indicated; the provision of Rs. 3,000 for each Primary Health Centre area for "medicine and corrective aids" can hardly do justice to this problem.

However, the report acknowledges in its preamble that "practically all (the surveys) report that malnutrition, including anaemia, vitamin and other nutritional deficiencies (ranged) from 40 to 75 percent". The total outlay for the entire project is about Rs. 30 lakh. Apparently, the Task Force while fully conscious of the gigantic task ahead, was constrained by the realisation that financial resources of a high order were just not available. The Task Force has certainly done a commendable job, acting as it had to, under this serious limitation.

Though what the Task Force has proposed is a pilot project, there is no projection in the report as to whether, and if so how, and in what time frame the programme will be extended after the pilot stage is completed; and how the resources will therefore be delegated. The Task Force Report, however, states that "strategies to be adopted for coverage of all PHCS in the country in a phased manner" will be recommended on completion of the pilot project.

Once again we urge that 10 percent of the budget of Rs. 953 crore allocated for Primary Education in the Sixth Plan be utilised for organising a comprehensive School Health Service, reflecting the spirit and substance of the Prime Minister's exhortation in her address at the inauguration of the National Heart Institute. The information generated by the pilot project proposed by the Task Force of the Health Ministry should prove most valuable in organising such a programme. The commendable efforts of the Task Force should not be allowed to go to waste, but should be pursued to their logical culmination.

C. Gopalan

Exclusive Breast Feeding for Six Months—An Attainable Goal for Poor Communities

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While it is universally accepted that breast milk provides the ideal food for an infant in the first three months of life, there is considerable difference of opinion regarding the optimum age when this should be supplemented by semi-solids, especially in the poor socio-economic communities of the developing world

According to Waterlow (Waterlow, J.C., Ashworth, A., and Griffiths, M., *Lancet*, Vol. 11, 1176-79, 1980) many well motivated mothers can maintain adequate nutrition by exclusive breast feeding until three, four, or six months or even longer, but the weights of many infants so exclusively breast fed start to fall off at three-four months. Ahn and Maclean (Ahn, C.H., and Maclean, W.C.: *American J. of Clinical Nutrition*, 33, 183-192, Feb. 1980) showed, however, that 96 infants of healthy mothers in an upper class community in U.S.A. did not need any supplement to exclusive breast feeding for a major part of the first year of life in order to grow adequately.

Gopalan (Gopalan, C.: *Bull. Nutr. Found.*, April 1981) suggests that in poor communities living under poor hygienic conditions, the theoretical benefits of early supplementation (i.e. before six months) if any, may be more than offset by the earlier onset of diarrhoeal episodes, which are a major determinant of infant growth and nutrition in many developing countries, and therefore recommends that it will be prudent to advise poor women to introduce supplements after six months of exclusive breast feeding.

While it is possible for women to breast feed adequately until four to six months, it is not clear if most women can achieve this. In view of the importance of the subject, the number of lives at stake and the paucity of availa-

ble information, we have in this paper reviewed data regarding breast feeding performance from the ongoing programme of comprehensive health care of the Department of Preventive and Social Medicine and Community Health of Christian Medical College (C.M.C.), Ludhiana, Punjab, India.

Health and nutrition education is the main feature of our methodology which has previously been described in detail (Dhillon, H., Dhanoa, J., and Cowan, B.: *Health and Population—“Perspectives and Issues 2”* (1), 5-25, 1979)

Five years ago we found that 55.5 percent of the children who died between 7-36 months, were females of the underprivileged (U.P.) communities of the villages and 64 per-

cent of these had severe malnutrition. These are poor landless labourers whose wives and children rarely attend a health centre. Most of their counterparts, the privileged (P), who account for approximately 65 percent of each village, are not poor and own at least a little land. Many are literate and not only take advantage of health centre facilities but comply with advice given at home.

Accordingly we intensified our home-based nutrition health education (N.H.E.), focussing on UP homes where there was an infant, employing as community health worker (CHW) one woman per village to reinforce more frequently, the advice given monthly by our field worker. Apart from the CHW, no extra staff was employed, and no food supplements were given. In a population of 19,300 in the 12 villages near our three centres where rural internship training is given, we began with all infants born in August 1977.

Data Review 0-6 Months

During the 32 months commencing August 1977, there were 1,500 live births in a rural population of

Table I
Mean weights of 650 infants (good performers) at three and six months according to sex, socio-economic status and whether exclusively breast fed (46.8 percent) or whether additional milk given

	Number	Mean wt. in kg at 3 months	S.D.	Mean wt. in kg at 6 months	S.D.
Males (P) breast only	100	5.9	±0.7614	7.4	±1.0733
Males (P) breast + "top" milk	132	5.8	±0.7991	7.2	±0.7460
Males (U.P.) breast only	72	5.6	±0.8337	7.1	±0.4801
Males (U.P.) breast + "top" milk	67	5.4	±0.6696	6.7	±0.3532
Females (P) breast only	82	5.5	±0.7896	6.8	±0.4949
Females (P) breast + "top" milk	106	5.5	±0.7909	6.8	±0.4962
Females (U.P.) breast only	44	5.2	±0.5466	6.8	±0.4713
Females (U.P.) breast + "top" milk	47	5.2	±1.0657	6.6	±0.2748

19,300. On May 31, 1981 (i.e. when the youngest was 14 months) we reviewed the first year growth records of all of these children, except 106 who had left the area and 183 who had died. Another 323 were excluded either because no weight was recorded before six weeks (many are delivered in the maternal village and return after six weeks) or if there was no weight record at six months.

For this presentation we included only infants who had a favourable start, that is full-term singletons, with birth weights of 2.5 kg or more and no congenital abnormalities or obvious birth trauma. This excluded another 56 infants, 34 low birth weight and 19 premature infants, 23 twins (one died), 8 with congenital abnormalities and 2 with the effect of birth anoxia. Of the remaining 802, 39 mothers (4.8 percent) failed to establish good lactation, thus leaving 763 infants who were fully breast fed until after six months.

Analysis of Data on 763 Infants

Birth weights. These were recorded in 513 (67.23 percent) at birth or within a few days. The mothers of 250 infants had refused to allow weighing until four to five weeks.⁶ However, weights at that time of more than 3.5 kg were considered to indicate a birth weight of at least 2.5 kg. In view of the poorer socio-economic condition of the underprivileged, we analysed the birth weights of the two groups separately. We were surprised to find little difference, the mean birth weight of the privileged being 3.01 kg (S.D. \pm 0.4517) and the underprivileged 2.9 kg (S.D. \pm 0.4604).

Socio-economic status. There were 483 privileged infants (63.3 percent) and 280 underprivileged. This is almost the same socio-economic distribution as is found in the whole community. The sample therefore, while consisting of half of the infants born in 32 months in these 12 villages, is representative of the villages in respect of socio-economic status.

Feeding 0-6 months. Of the 483 of the privileged, 206 (42.65 percent) and, of the 280 of the underprivileged infants, 141 (50.35 percent) received nothing except breast milk for at least

eight months. The remaining 416 infants, breast fed regularly for at least six months, received after three months in addition, what is known as "top" milk, and the amounts given indicate that most of the calories are supplied by breast milk. Proprietary foods are very rarely used before six months.

Use of bottle. Of the 277 privileged, 207 were given their top milk with a spoon and cup, and 70 (25.2 percent) using a feeding bottle. Of the 139 underprivileged, 57 (41 percent) used a bottle.

Since the purpose of this presentation is to show how many infants in the rural areas can achieve a satisfactory nutritional status on exclusive breast feeding until six months, we analysed the performance in two groups, 650 (84 percent) who had achieved at least six kgs by six months (80 percent of the Harvard 50th centile) and 113 who did not. The former we call good performers, the latter 'poor performers'.

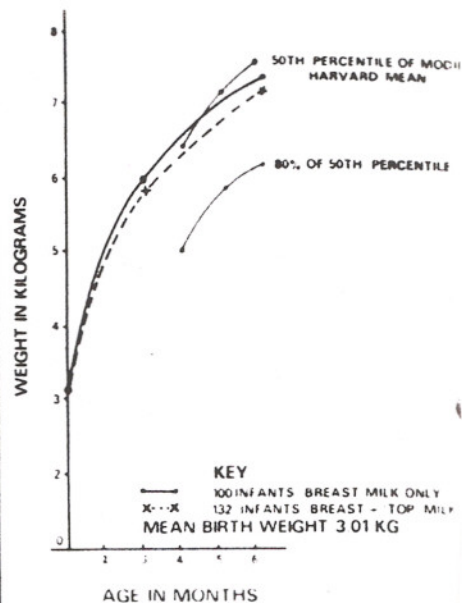
These figures show that the addition of "top" milk was not advantageous nor was it harmful, the mean weights at three and six months being the same or slightly less with the addition of top milk than on breast milk alone. Moreover, 55 percent of good performers and 57 percent of poor performers received "top" milk.

Figures 1-4 show growth according to sex and socio-economic status. Four curves are shown in each figure for infants 0-6 months, (a) exclusive breast feeding, (b) breast and "top" milk, (c) 50th percentile of Harvard standards, and (d) 80 percent of that 50th percentile (standards for comparison as recommended by the Indian Academy of Paediatrics).

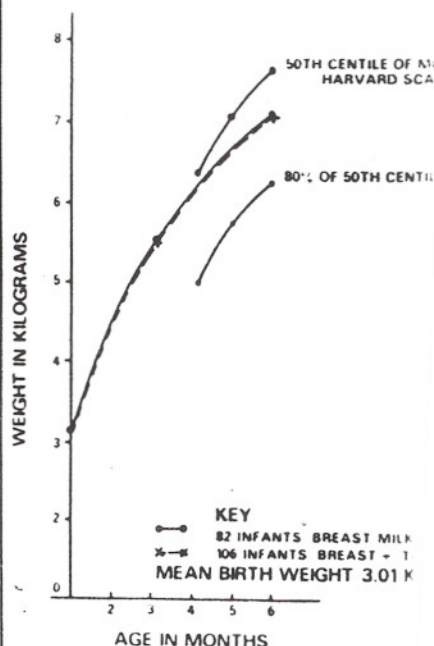
Discussion

Sex and socio-economic status: Table II shows that the percentage of good performers was higher in males irrespective of socio-economic status. This sex difference is statistically significant ($P < 0.05$). The curves also show that amongst the good performers, males of both communities did better than females and, on exclusive breast feeding, weights were higher than breast milk + "top" milk.

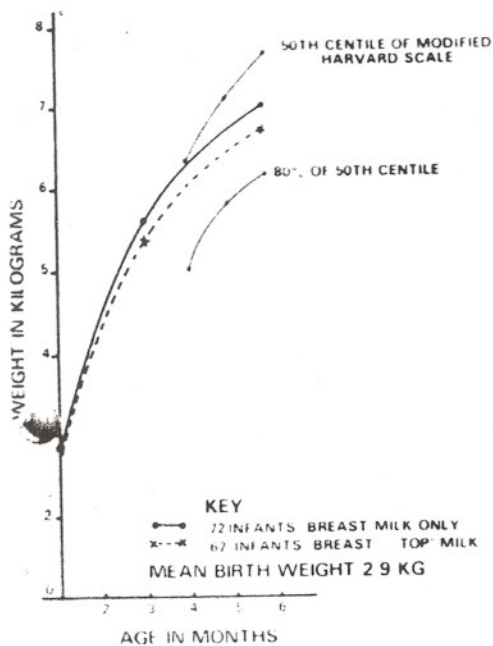
PRIVILEGED MALES



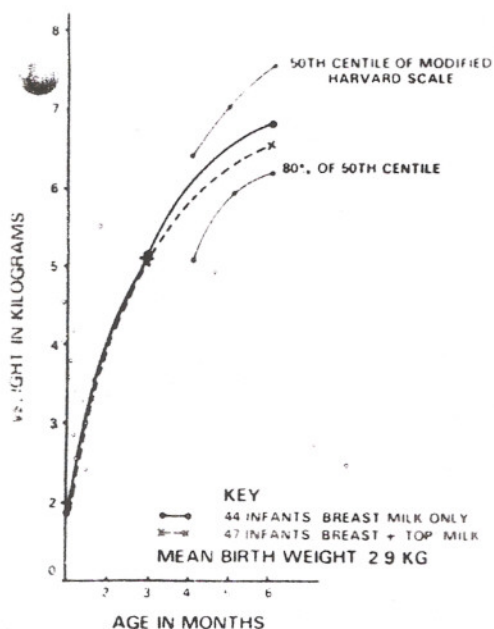
PRIVILEGED FEMALE



UNDER PRIVILEGED MALES



UNDER PRIVILEGED FEMALES



The weights of the privileged males on exclusive breast feeding were almost identical with the 50th percentile of Harvard standards for the entire six month period. Those of the underprivileged males were identical up to the third month and were nearly 95 percent of the 50th percentile of Harvard standards by the sixth month. The weights of the females of both communities, while almost identical, whether on breast milk alone or with additional "top" milk fell slightly short of the 50th percentile of Harvard standards (about 90 percent).

In spite of their disadvantages of poverty, poor diet, unhygienic surroundings and overwork, with antenatal preparation for exclusive breast feeding, immediate post-natal advice and encouragement by the health team, 90 percent of the underprivileged mothers were able to achieve a good state of nutrition in their male infants. However, in spite of this advice, they achieved this in only 72.7 percent of their females. The same sex differences are seen amongst the privileged (Table II). This appears to confirm Jelliffe's (Jelliffe, D.B. and E.P.F.: Contact 50, April 1979, Christian Medical Commission, World Council of Churches, 150, Route de Ferney, 1211, Geneva, 20, Switzerland) observation that if motivated, mothers whose nutritional status is sub-optimal can breast feed satisfactorily. Disinterest on the part of both communities towards the female infant therefore appears to have a greater negative influence on breast feeding performance than does socio-economic status.

Importance of the infant to the family:

We have found that the only female who is of high priority is the first born so long as she is the only living child. However, a subsequent pregnancy or a delivery of a male, diminishes her priority status. This is especially true for the underprivileged. First and second males are always of very high priority irrespective of caste or family size. This is true for the third male unless the family is large. Of doubtful or low priority are all females except the first and this diminishes where there is no son. This is particularly true of the underprivileged whose response to N.H.E. for the third and fourth female is often "let her die" the obvious explanation for the large contribution to infant and toddler mortality by the females of this community.

The accuracy of this subjective assessment has been confirmed by field workers and medical staff in homes of nearly 1,000 infants over a four year period, and team leaders and field workers are able to predict at birth and by continuous assessment which children will be neglected and are therefore high priority targets for extra efforts.

Infants and their importance to the family are shown in Table II according to performance.

These figures confirm our impression that mothers will almost always care for infants who are important to them. Privileged males, of highest priority, have the best performance, the poorest are those of lowest priority, the underprivileged females. Prior to our special approach of "the greatest effort for the most needy" the performance of the low priority children was poor. Now, while there has been

Table II
Priority according to sex and performance

	Total No.	High priority Percentage	Good Performance Percentage
Privileged (males)	245	179 73.06	232 94.6
Underprivileged (males)	155	89 56.32	139 89.7
Privileged (females)	238	77 32.35	188 79.0
Underprivileged (females)	125	31 24.8	91 72.8
Total	763	376 49.2	650 85.1

little change in attitude towards these children, it will be seen from Table II that 103 males (27.7 percent of 371) and 171 females (61.3 percent of 279) infants were good performers in spite of their being of low priority.

Diarrhoeal episodes: While many mild episodes in very young children go unreported the underprivileged infants had diarrhoeal episodes on breast milk and "top" milk than on breast milk alone. Use of the bottle did not appear to increase the number of episodes, but numbers are small.

Hazards: Village infants, especially the underprivileged, have to contend with many social as well as health hazards. In view of the small number of poor performers, it is not possible to judge the effect of hazards on performance. Twenty five percent had at least one diarrhoeal episode, 30 percent had severe upper respiratory infections including a few with bronchopneumonia. Twelve percent had skin infections and seven mothers (0.9 percent) were pregnant by the time the infant reached six months.

Two infants had measles at six months. Of the privileged mothers only 25 (5.2 percent) went out to work compared with 76 percent of the underprivileged. The affluent will continue to decide for themselves how they will feed their young infants and when to supplement breast milk with semi-solids. The privileged infants in our villages however, did very well on exclusive breast feeding and less well when "top" milk was added.

Conclusion

From our experience we are certain that it is our duty to teach workers not to add to the tremendous burdens of the mothers of the underprivileged community by asking them to give anything other than breast milk for six months. We have shown that underprivileged mothers, 76 percent of whom have to work in the fields, in spite of poverty, poor diet and unhygienic surroundings, are able to breast feed satisfactorily 90 percent of their male infants for six months. Our duty is therefore to motivate these mothers towards exclusive breast feeding in the prenatal period, to encourage them throughout the first six months and, as far as possible, to do this for their female infants also.

A Révisit to Rewa

C. Gopalan

Rewa and the surrounding villages of Madhya Pradesh have long been known as the major endemic zone of neurolathyrism, the crippling paralysis of the legs afflicting poor wage-earners in the full bloom of their youth and adulthood. The clear and indisputable association between the habitual, heavy consumption of the pulse, *Lathyrus sativus* (Kesari dal), which has been the staple diet of the poor in this region for centuries, and the occurrence of neurolathyrism, had also been established several decades ago.

It was the practice of the rich farmers of the region to pay wages to their bonded labour in the form of *Lathyrus sativus*. As early as 1907, the enlightened ruler of Rewa had issued a proclamation banning this practice, but this well-intentioned edict was successfully thwarted by vested interests. Subsequently, attempts to ban the cultivation of *Lathyrus sativus* could also not succeed, because *Lathyrus* is a hardy crop which could be grown easily even on unirrigated land; while the seeds of the plant had become the established staple diet of the poor, the shoots provided fodder for the cattle. Thus *Lathyrus sativus* had become strongly entrenched in the agricultural economy of the region, and alternative para-crops which could displace *Lathyrus* in the region could not be identified and propagated.

It was in 1955 that this author first visited Rewa to obtain first-hand knowledge of the problem of neurolathyrism. The disease was then at its peak and scores of poor people, mostly men, moving about in an awkward gait with the help of one or two long sticks was a very familiar sight in the streets of Rewa. *Lathyrus sativus* was clearly the staple—almost the only major food item—of the great majority of the poor, among whom the disease was common.

Following that visit, a field Unit of the ICMR was established in Rewa under the charge of Dr. M.P. Dwivedi.

This Unit carried out detailed surveys of several villages in order to assess the prevalence of the disease and the factors contributing to it. It was estimated that more than four percent of the population in the region were afflicted with the disease. Laboratory studies designed to identify the toxic factor in *Lathyrus sativus* were also initiated at the National Institute of Nutrition, Hyderabad.

These studies resulted in the identification by Dr. D.N. Roy of a toxic factor in *Lathyrus sativus*, later characterised as B-oxalyl amino acetic acid (Bo AA). A simple procedure for removing a major part of this factor from the seeds through parboiling was also developed. This procedure was so simple that it could be applied in the village or at home.

Strategy for Prevention

On the basis of these studies, a three-pronged strategy for the prevention and control of neurolathyrism was suggested:

- educating the poor community to avoid using *Lathyrus sativus* as the sole staple diet but to use it only in small quantities, if at all, in admixture with cereals and millets.
- persuading the community to parboil the seeds before cooking them.
- dissuading the landlords from paying their labourers wages in the form of *Lathyrus*.

Though attempts were made to implement this strategy, the programme could not make much headway in the face of resistance by affluent vested interests on the one hand, and apathy and lack of cooperation on the part of the poor, on the other.

Under these circumstances, a re-visit to Rewa by the author towards the end of 1981 (almost 25 years after his first visit) revealed some surprising and paradoxical developments. The unmistakable impression, corroborated by several participants in a seminar convened in Rewa on that

occasion to discuss the problem, was that the disease was definitely on the decline, though the Professor of Medicine at the Rewa Medical College reported having seen nearly 30 cases during that year. The 'contract' labour (an euphemism for 'bonded' labour, now that the system of bonded labour has been officially abolished) were not any more getting *Lathyrus sativus* in lieu of their wages; instead they were getting either money or wheat and other millets.

On the other hand, available figures indicated that the cultivation and total production of *Lathyrus sativus* in the region had not declined. Indeed, according to one participant in the seminar, there was actually an intensification of *Lathyrus sativus* cultivation by the rich farmers, and even irrigated land was being pressed into use for this purpose. Strangely enough, the local agricultural research station was also engaged in research to identify high yielding varieties of *Lathyrus sativus*.

The nagging question was: if *Lathyrus sativus* was not being used to provide wages for the poor, if it was also not consumed by the affluent communities and if its export was legally banned, why was the crop still being cultivated and how was it being used?

The reason why the poor landless labourers were no longer being paid their wages in the form of *Lathyrus sativus* was quite obvious. *Lathyrus sativus*, which was the cheapest and the most inexpensive food item in 1955, had by now become a relatively

costly commodity. Its wholesale price was now as high as Rs. 270 per quintal as against Rs. 170 per quintal for wheat. It was no more a profitable proposition for the landlord, thus forcing him to switch his mode of payment to wheat.

Evidently, the poor landless labourers were at long last being "saved" from the poisonous seed, not because of the researches and educational programmes of the last two decades, but solely due to the intervention of market forces. The very greed and profit motive of the landed gentry, which for centuries were responsible for the perpetuation of neuro-lathyrism among the poor in Rewa, have apparently helped to redeem the poor by removing *Lathyrus sativus* out of their economic reach.

Breach of Law

What then happens to all the *Lathyrus sativus* being cultivated in the region? If the crop is not being consumed locally, it must be obvious that it is being exported. But there is a law banning export of *Lathyrus sativus* to other states. It can only be concluded that like many other 'laws' concerned with food commodities, this law too is being 'observed' more in its breach. According to available information, there is in fact a very brisk and lucrative export trade in *Lathyrus sativus*, which is being moved to other neighbouring states for adulteration with other pulses. It is also reported that Bengal gram flour is being freely and liberally adulterated with *Lathyrus sativus* flour.

This prompts us to ask why this illicit export trade should have picked up momentum only recently. When the wholesale prices of cereals and of pulses are compared for the period 1955 to 1981 (See table), it will be seen that till about 1960, the wholesale price of wheat was higher than that of pulses. However, in the wake of the "green revolution" and with the intensification of cereal cultivation relative to pulses, the per capita availability of pulses declined. Naturally the prices of pulses soared and since the mid-sixties they have continued to exceed the price of wheat. Adultera-

continued on page 8

REVIEWS AND COMMENTS

Nutritional Consequences of "Development"

A visit to the part of Punjab which surrounds the prosperous city of Ludhiana makes it easy to believe a surprising report that only 11 percent of the rural families of the State live below the poverty line. Few are unable to share the fruits of the tremendous developments in agriculture and animal husbandry which have taken place during the past few years.

It is difficult therefore to reconcile the obvious prosperity with the persistently high Infant Mortality Rate (IMR). It raises the questions, "Do all share in the benefits of development? Can we expect the fruits to trickle down automatically to all, or does the group which contributes to the high IMR somehow miss out?"

From our experience in the 14 villages (population 23,000) which have been the field practice area of the Department of Social and Preventive Medicine and Community Health of the Christian Medical College, Ludhiana, since 1973, we now know that the "helpless"—the pregnant women, the viable foetus and the under-three child do miss out and, in some instances, "development" may have an adverse effect on health of this group.

While it had been simple to obtain accurate numbers of infant and toddler deaths, this information did not tell us WHY babies died and how these causes could be removed and deaths prevented. This information, unavailable from the village vital statistics, was only discovered by the field worker's specific enquiry in each home, and yielded much hitherto unknown and unsuspected information.

The fruits of development were being enjoyed by the "privileged" approximately two-thirds of each village, people who do not belong to the schedule castes, landowners, few of whom are poor, many literate, and all able and anxious to take advantage of every facility, including health mea-

Wholesale Prices of Wheat and Pulses in India (Rs./Quintal)

Year	Wheat	Bengal Gram	Red Gram	Black gram	Green gram
1955	31.8	20.0	25.7	32.1	30.5
1960	41.2	35.7	50.3	48.8	53.1
1965	61.9	66.2	81.3	78.6	88.4
1968	84.3	90.4	108.1	121.4	114.1
1973	92.9	154.9	146.6	184.5	212.1
1977	134.2	153.9	223.6	253.5	226.0
1980	146.2	282.7	343.5	268.4	353.7
1981	162.5	351.5	442.5	291.6	384.2

Figures relate to average of 9 months (April-December)

Source: Bureau of Economics and Statistics

ures, offered to them. This was not so in the case of their counterparts, the underprivileged. The latter make up one-third of the village population, they are mostly poor, illiterate landless labourers.

Development had certainly increased their work opportunities, their incomes, and consequently the total amount of food consumed daily in most homes; and the state of nutrition of the wage earners and bigger children was satisfactory.

For the mothers of this community, however, "prosperity" had resulted in more work, more food to be cooked, few opportunities to rest even during the later months of pregnancy, little time to expand on the feeding of an infant after breast milk had become insufficient for its growth needs, especially if she was an unwelcome female in an already overlarge family.

These females accounted for more than half of the infant and toddler deaths in our area, and a nutritional profile of children in the second and third years of life showed that almost 50 percent of these little girls spent the 24 months in severe degrees of malnutrition, while only 20 percent of the males of this community were so affected. Very few males and only 15 percent of the females of the privi-

leged had severe malnutrition.

Previously many buffaloes gave just enough milk for the family's needs and there was little to sell. Now, with improvement in animal care, every buffalo had become a source of income, the milk was collected and sent to the city, leaving just enough for the family's tea. There was also the problem of the helpless child left outside the locked door while the mother took advantage of the increased work opportunities in the fields. While she may take a very young infant with her, and the three year old may wander into the home of a neighbour, the mother has no alternative but to leave the one year old child alone or with a sibling. This is increasing as work opportunities increase, and eight percent of a group of children between seven and 24 months were left in this way, a few with siblings or older relatives but most alone, deprived of food and water even in the hot weather, until the mother returned hours later.

The poor young pregnant women knew that their rich neighbours were willing to pay for limitless amounts of fodder for the buffaloes to increase the milk yield. So they brought fodder from the fields carrying heavy loads on their heads. After a few days of such hard work foetal movements

and other connected factors. This study will be carried out on behalf of the Foundation by Dr. Dwivedi, the same investigator who had studied this problem nearly 25 years ago and who is therefore fully conversant with the terrain. The study will throw a great deal of light on the many factors discussed above and provide an authentic basis for action. Obviously, here is a situation which needs to be watched and monitored with great alertness and care.

Nutrition scientists in their idealism often plead for a "nutritional orientation" to our agricultural policy, the implication being that the agricultural cropping pattern could be dictated and influenced by health and nutrition considerations. However, the reality seems to be that commercial considerations and the play of market forces will determine the pattern of agricultural development, irrespective of the health and nutritional repercussions of such development

increased and premature labour followed. The young women were unable to care for the tiny babies who died a few days later. Thus "development" in these cases had increased the numbers of premature low birth weight babies.

When we had thus "dissected" the problem, we learned of some of the additional burdens imposed on the mother by "prosperity" and we came to realise that IMR and malnutrition would not decrease without an inbuilt health and nutrition component specially designed to meet the special needs of the underprivileged mother, and help her to find a solution which would not deprive her of income-generating opportunities while not jeopardising her health.

Need-Based Approach

A need-based approach through specific nutrition health education given by the field workers was therefore instituted. No extra clinics were arranged, and no food supplements were given out. Attitudes however were changed and mothers were persuaded to give themselves a break from child bearing by acceptance of an intrauterine device, and infant feeding practices were changed: the women were motivated to feed their infants exclusively with breast milk until six months old and to introduce solid supplements thereafter.

Previously only 12.9 percent of children had received adequate solids by the age of two years and 25.9 percent by three years. This was increased to 70 percent and 83.5 percent respectively and the severe malnutrition in the underprivileged females was halved. To achieve an adequate calorie intake on chappatis, tea, vegetables and an occasional dal was easy neither for the mother nor the child, but many did achieve this.

As a result of this programme, IMR has been significantly influenced. In 1977 there was almost three times as many deaths of underprivileged post-neonates as of the privileged. In 1980 the number of "underprivileged" deaths had fallen dramatically and was slightly less than that of the privileged. Post-neonatal infant mortality had been halved within three years.

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REWA: continued from page 7

tion of pulses like Bengal gram with a hardy pulse crop like *Lathyrus sativus*, which grows even on unirrigated land, have therefore become an attractive proposition.

We may temporarily rejoice over the fact that the "contract" labour of Rewa has been thus "saved", but if the landlords of Madhya Pradesh, egged on by their greed, continue to intensify cultivation of *Lathyrus sativus* (unwittingly abetted in this process by misguided agricultural research scientists), and if they pursue the export of this commodity with even greater vigour in future, they will eventually "succeed" in exporting and disseminating neuro-lathyrism which was all along localised to some parts of Madhya Pradesh and Bihar. It may well become a national problem.

The Nutrition Foundation of India has now sponsored a study in Rewa and its environs, in order to ascertain the current prevalence of the disease