Beyond Calorie-

Veena Shatrugna

Former Deputy Director NIN

Thiruvanthapuram

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- At the out set Thank you Kerala, for your nurses who fanned out to reach the remotest corners of this country to heal the sick in large and small hospitals
- They brought with them an important skill and taught us patience. Love and selflessness.
- I do not know of any other country with such a phenomenon.
- On behalf of crores of Indians I bow before you

Kerala’s Onward March

Children-Nutritional Status

Children	Kerala	India	States	
Low Birth Weight	14%	28%		
Low Weights for age	19.7	32	40+ Bihar, UP 22-25 Punjab, Sikkim	Improves with mother's nut Statu
Low Ht for age Stunted	23.4	35		
Wasted	15.8	19.3		
Anaemia (6mts - 59mts)	39.4	67%		
IMR	5	28		# Kerala's rural figure are better than Urba figures
		Improves with incomes. Worse among SC and STs		

• Women

WOMEN	KERALA	India	States	Out of Pocket Expenditure
Institutional delivery	99% 70- Pvt. 30- Public	88.6% Pvt. 47.5		Rs.26,134 Pvt. Rs. 35,195
C- Section	44% Pvt and Public	21.5% Pvt. 47.5 Public 14.3	60.7% Tel.	Govt. Pub. 3,500 Pvt 21,000
MMR	19 (32)	97		
Pre term	7.21			
Anaemia Pregnancy	31.4	52.2		

Nutritional Status –Adults (15-49yrs)

	Kerala		India		States	
	M	F	M	F		
BMI<18.5Kg/m	10.0	10.1	16 .0	19.0		
BMI >25.0Kg/m	38.1	36.4	23	24		
High Risk Waist/Hip Ratio	70.7	56.8				
Anaemia	17.8	36.3	25	57		
iabetes	24.8.	27				
ypertension	30.9	32.8				

The Kerala Model

Parameters like weights

- **If you eat well…you put on weight, and even height if under 18**
- **All mothers could always tell**

- **Easy to measure**
- Small babies, Birth weights,
- Low weights and heights in kids and adults- Undernutrition etc.

Why are these important?

Did science use popular knowledge to map the Nut status of the country?

- **MAYBE**
- **How did science decide which foods helped those who were thin?**
- **GOVT POLICIES NOT Science**

- **Problems with calories**

Kerala's Achievements

There must have been a lot of

Planning

Understanding the complexities of a culture

Finding budgets

Building hospitals, PHCs, sub centers,

Hiring Doctors, Nurses, support staff,

Putting systems in place

Medical and Nursing colleges

Reference Body Weights and Heights of Children-WHO Stds

Age Years		Height cms Boys	Weight Kg (B)		Height cms Girls	Weight kg(G)	
0		49.9	3.3		49.1	3.2	
1 year		75.7 (25)	9.6		74.0	8.9	
3 year		96.1 (21)	14.3		95.1	13.9	
5 year		110.0 (14)	18.3		109.4	18.2	
Adult (NCHS)		177.0	65.0		164.0	54.4	

Areas Of Concern for Kerala

hildren

w Weights &
Heights
ecially Anaemia in Children

dults-

aemia
esity
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abetes
ections - Privatisation

- **Need to go back to science**
- **What we eat**
- **Secular changes**
- **Wages**
- **Poverty line**
- **PDS for the poor/Tribals/Covid**
- **Body composition**

Is there a Food crisis in India?

Where did we go wrong ?

e need to go back to Imp Developments in the

's and 40's.
y the 1930s

dians had established their mastery in Chemistry with Lab experiments i
y 1937, over 300 foods analysed and categorized in what is now
cognized as the classic *Health Bulletin No.23*,

would become the
asis of Food Requirements for Indians

ie content of Common Foods analysed and classified into

Cals in 100gms (Raw Amts)

ie Rich foods

s.....Rice, Wheat, Ragi, Jowar, Bajra… **340cals**

….Tuar, Moong, Chana, Black gram…..**340cals**

oil seeds…Groundnut, Cocanut, Almond..**550cals**

…….390 cals

y……..340cals

d fat……900cals

Calorie content of Protein rich foods Cals in 100gms

Milk products..Paneer, Cheese,etc……300-450 cals

Fish……100-150 cals

Meat and Poultry……100-200cals

Milk……60- 100 cals

Rich in Vitamins and Minerals **Cals in 100gms (Raw Amts)**

Roots…. Potato, Beet root, Carrot…… **50-100 cals**

Greens….Palak, Thota kura, Bacchali etc …….**50cals**

Other Veg…Cauliflower, Brinjal, ladies finger…..**50cals**

Fruits.. Banana, orange, apples grapes, melons..**50-100**

During the War Years India did not have a Food Policy in the eventuality of a

- Drought
- War
- Crop Disease
- Imports
- Procurement
- Storage
- Distribution

The food department of the Government of India had been set up only in 1942 to deal with the urgent task of food procurement and distribution.

It was in 1944 that the first officially recommended diet was formulated

Subcommittee on Nutritional Requirements set up

With the knowledge generated thus far and Foods classified

Foods Classified - into

a) Calories Rich
(Cereals, Pulse, Sugar, oil etc.)

b) Protein Foods,
(Pulse, Milk, Nuts, Meat, Eggs Fish)

c) Foods with Vitamins and Minerals
(Meat, liver, Vegetables, fruits),

d) Oils and fats
(nuts, oilseeds, butter, ghee, edible oils, etc.)

Calorie Rich foods also have some Proteins
(Rice and wheat……6-10% Proteins)

AND

Protein Rich foods have calories

Dals have…… 350cals)
Milk Meats and eggs…..70-160cals)

ries need is large, compared to Proteins, Vitamin
Minerals….

Food Requirements laid down in terms of calorie
940s

As Follows

entary 2400 kcals
erate 2730 kcals
vy 3490 kcals

lturally and regionally appropriate foods such
as wheat, rice, eggs, milk, chicken, pulses,
, greens, potatos, nuts etc. would be consumed

his would satisfy Calories, but also Proteins,
Vitamins, Minerals and other nutrients.

In was obvious that
One nutrient should come from many foods
One Food should provide many nutrients

ners had to budget for food, to Provide calories

now looked for Cheapest source of Calories

ther Nutrients were ignored

and Wheat could satisfy calories.
e and Wheat was considered food

ne objected as India had just come out of a
ne post independence

t officials do not read Research Papers

Scientists had warned several times

e non-cereal portion of the diet should first
ide most of the essential nutrients in adequate
unts" (Aykroyd 1944)

T IMPORTANTLY

ughout the 1940s, and 50s

nce advocated milk and Eggs for children

lacing milled rice with Parboiled rice, and

tion of oil or ghee in children's diet.

Planners/Scientists were in a hurry…

ap Energy sources like cereals were advocated
alorie requirements-

eals provided bulk, satiety, and culturally
ptable

Requirements based on Calculated diets:

ucrats – had to find 2400cals to satisfy requirements

d on lab work on calories in food)

tience with Nutrition or Science

e needed food Not Cheapest calories

benefit analysis made it worse.

Cheapest source of Calories

Calories in 100gm		For 2400cals.	Cost (Rs.)
Cereal --	360	650gms	25
Potato --	100	2.4Kg	50
Banana….	100	2.4Kg	100
Oil…….	900	250ml	30
Oilseeds…	560	400gms	50
Pulse …….	360	650gms	100
Milk…….	100	2.5 litres	150
Meat……..	100	2.4kg	400

about Growing Children, Preg. and Nursing mothers?

more Proteins from Animal foods such as milk, eggs,
nd meat..

Because

ein derived from vegetable foods is incomplete- Amino
(AA) not right for human tissues

al proteins closest to human muscle, bone and blood and
o be of high biological value

Animal Protein (20%)

Protein of a high Biological Value (BV) is one which has a AA pattern as close as possible to that of human tissues

Eggs and Milk.. Standard Protein…BV-100

Cereals rice, wheat. millet, pulse etc. Poor quality Protein …BV 60-70

.

Research on Vegetarian sources of proteins continues with expts. on children

In all the studies Children given egg and milk had better height and weight compared to the vegetarian group.

(Aykroyd and Krishnan 1937; Krishnan & Mitre 1938; Someshwar Rao ; ICMR Special Report Series No. 36, 1961).

Children given cooked Soya beans, lost considerable weight after 20 weeks

By 1955 it was clear that whatever the sources of vegetable proteins,

Milk and egg protein was far superior for undernourished children.

Vegetarians don’t give up

Eat 2-3 Veg foods, for better quality protein

The Scientists were quick to assume that EVERYONE eats cereal pulse at every meal.

RDA 1968: (Gopalan C)

Milk, eggs, meat and fish are removed from all official diets

So a Calculated Diet is put in place with appropriate ratios of cereal pulse etc.

Balanced Diet for an adult Sedentary Male (gms)

Cereals	Pulses	Leafy Veg	Other Veg	Roots	Milk	Fats	Sugar
460	40	40	60	50	150	40	30

Source: Recommended dietary intakes for Indians, ICMR, New Delhi, Srikantia 1980

?? Nuts, eggs, fish, Fruit, meat,

Myth of protein gap (C.Gopalan. AJCN, 1970)

Thus, vegetarianism for the nation is endorsed scientifically

Though

There was food Def. def. in 60-70%

Vitamin A and other Nutrient def. in 90%

Anaemia in 60%

Growth failure, Underweight, Stunting, and Wasting

Most people specially Women have so called

Non Specific Symptoms

Body Pains,
Bone pains,
General Fatigue
and of course Anaemia

The Poverty Line: Calorie from cheapest source- cereal become interchangeable.
Fixed using 2400 cals- anyone who can buy 2400 calories is above poverty line

Minimum Wages Act, 1948 – Fixed "Scientifically"

Based on cost of 2400 cals per worker (from cereals)

And calories needs for 4 family members is added. (Wife and 3 children)

Nutrition Policy:

1. **Agriculture**… Green Revolution….entirely cereal based.

2. **PDS** ….Grains at subsidized rates, decline in the importance of other crops

3. **Food and Rice/Wheat** become inter changeable terms.

4. Free Rice Scheme

No mention of milk, eggs, chicken or fish or nuts even for children

Not surprising that people are

Short

Sick

Bone pains

Anaemia

Tiredness, Backpain

Consequences:

ia in over 70 to 90 %….Vegetarian fix, with cereal fix

ood stunting…only milk increases IgF levels not Veg.
ns

eat, eggs, any non veg are illegitimate foods, even for
n in ICDS

orosis, bone pains, muscle pains…Calcium req. was
d from 1gm to 400mg. To avoid milk

ed muscle Mass…Indians have high body fat % at low wts

f cereal in metabolic Syndrome…? ?Barkers Hypothesis

he Scenerio in the Clinic

Doctors…don’t Understand

No Diagnostic Tools

May scold the patient

Write BC, Painkillers or

Sleeping Tabs

Women Change Doctors

A new problem has emerged

We have people who now advise about childrens foods…These are

Organics

Millets

Vegetarian

Satvik

Fortification

Vegans

Biscuits