

A Name Immortal in the Annals of Sri Lankan Nutrition

Vidyajothi Dr. Beatrice Vivienne De Mel

Dr. Beatrice V De Mel nee Abeyaratne (Brighty) hailing from a family of doctors obtained the education at the C.M.S. Ladies College. She was the Junior Tennis champion of Ceylon and later captain of Tennis team when she was in the University of Ceylon. She passed out as a Doctor at the Faculty of Medicine Colombo, in 1948 and worked for six months at the only Children's Hospital in the island as her ambition was to follow the footsteps of her father (the first Paediatrician of the country) and become a Paediatrician. But her father focused her attention in another positively associated direction – Nutrition.

At an early age her father Dr. L.O.Abeyaratne MRCP (Edin), OBE, Director of the Lady Ridgeway Hospital imbibed her with the realities of malignant malnutrition: Vitamin A induced blindness – Keratomalacia together with kwashiorkor and marasmus seen everyday in every bed in the tin sheds of the Children's wards of the Lady Ridgeway Hospital. Her mother Dr. Augusta Pinto on the other hand worked hard in improving the health of women. She was the first women doctor in Puttalam in the early 1930s. Serving mostly Muslim women whom previously had no access even in pregnancy to health services. She was the first doctor to suggest that abortion should be legalised because of the horrors she encountered of unwanted babies in the Lady Ridgeway Hospital. Dr. Brighty's eldest brother Dr. Ernest PhD (Oxford) in Agriculture was the founder of scientific dry zone farming and spearheaded the setting up of the Agricultural Research Station at Mahailuppalama. The agricultural extension service throughout the country that was set up was an example to others in the region. He introduced amongst host of others, corn and carotene rich Batala (Sweet potato) and later spearheaded the growing of corn and soya for the Thripasha programme in the late 1970s and 1980s. Her youngest brother Michael FRCS (Eng.) paediatric surgeon married Dr. Karmalika (Consultant Paediatrician) daughter of George Wickramasooriya Professor of Obstetrics whose pioneer work on malaria and Ankylostomiasis leading to severe anaemia and its effect on maternal, neonatal mortality and stillbirth. They formed a partnership extremely successful in Gampaha, Anuradhapura and the Lady Ridgeway Hospital. This background reminds us "Life's Flame Ancestors Leave Behind is the Beacon for the Future".

Consequently, she joined the University of Ceylon in 1949 as a Research officer under the headship of Professor H. Cullumbine, Prof. of Physiology of the Faculty of Medicine where she

started work in research and teaching, first in the Department of Physiology. Prof. Cullumbine embarked on the study of the various Biochemical indices of the normal child and on prematures at the Government's De Soysa Maternity Hospital. Later the study also covered fatty livers in malnourished children at the Lady Ridgeway Hospital, published in the Ceylon Medical Journal 1958 with Dr. Jayasekara. When Prof. Cullumbine left, she worked under Prof. Koch where she embarked on the study of the age of Menarche in adolescent Sinhala, Tamil, Moor and Burghers in relation to growth and socio-economic status throughout Ceylon. Her most significant finding was a body weight of 40kgs and a height of 148cms in 680 ethnic adolescents studied at menarche and within 5 months. At upper and upper middle socio-economic levels menarche at 9, 10, 11 and 12 years and of the lower socio-economic level at 13, 14 and 15 years which she presented at the Thirteen Annual Session of the Ceylon Association for the Advancement of Science in 1957.

She jointly with her illustrious father, Dr. L.O. Abeyratne has carried out a comprehensive study on the growth of Sri Lankan infants and pre-school children in the 1950s and with her first salary bought the specified equipment. Growth standard for Ceylonese children birth to 5 years were made from over 10,000 children studied from the educated well nourished elite living mostly in the city of Colombo and the Western Province over 10 years from the 1950s. The length weight, head and chest chart made was compared first with the Harvard and later with the NCHS Standard. The data was presented at the 8th Paediatric Conference in 1970 and 14 years later at the 22nd Paediatric Conference on Growth Retardation in Sri Lanka children as a result of the original findings of the earlier study, in the Urban Colombo.

She married Nissanka Lakshman Abeywardana De Mel who was specially qualified in scientific agriculture, animal husbandry towards maximum productivity. He was a master of the English Language, Play writer and accomplished Tennis player. His strong support assured her success in her work.

In 1954 – 55, she became a Research Officer under Prof. Noel Baptist, Professor of Biochemistry and switched to protein amino acid intakes of children on vegetable protein diets, published British Journal of Nutrition, 1955. She was fortunate in obtaining a solid foundation in nutrition while lecturing, demonstrating to medical students and researching with the Professors while at the Department of Physiology, Biochemistry and the Pharmacology of the Faculty of Medicine, Colombo for six years from 1949 – 1955. By now she was fully convinced that nutrition

was her line of interest and she joined the Nutrition Department of Medical Research Institute in 1956. The Head of the Department was Dr. D.B.Gunasekera a brilliant medical Nutritionist (MRCP, MD Lond), intensely interested in Breast feeding and weaning immediately ordered her to determine the composition of breast milk of lower and middle income lactating mothers at the De Soysa Lying Home as he had already secured Hylten's Humolactor from London to obtain breast milk samples with ease and statistical comparability throughout Ceylon. The significant finding of the study was the low vitamin A content (retinol) 27.5 ± 16.89 and 16.6 ± 8.25 in the 3-5th 6-7th day of lactation respectively of low income mother compared with the middle income of 45.0 ± 17.4 and 44.8 ± 25.48 of which the difference was found to be significant ($p > .05$) on the later part of the week. The adequacy of vitamin A in the hospital diet was only 43% due to the unavailability of milk while the lactating mothers of the rural poor was only 16% due to low ingestion of animal foods. These findings were published in the Ceylon Medical Journal and of the Ceylon Paediatric Association in August 1962.

In 1961 she brought to the notice of the National Public Health Council of which she was a member that the nutrition knowledge of the health staff and mothers was poor. Dr. de Mel did the publication of simple booklets and leaflets on the mothers diet during pregnancy and lactation of which Cicely Williams, WHO Advisor wrote the preface was printed at the Government Press, 100,000 copies in English, Sinhalese, and Tamil and distributed through out the country to all health personnel and all mothers attending antenatal clinics together with leaflets on feeding infants, toddlers and pre-schoolers especially during the time of weaning.

From 1958 onwards to date one of her specialities in Nutrition research has been on nutritional anaemia. In 1962, after 2 years of research, she brought to the attention of the National Council of Maternal and Child Health, that nutritional anaemia in pregnant mothers was a serious public health problem. The WHO Consultant Dr. Van Dyke present at the meeting thereafter requested WHO assisted Dr. Sood of All India Institute of Medical Sciences visited Sri Lanka 3 times in 1969, 1971 and 1972 where in all surveys through the length and breath of this country in all the 24 districts. The percentage of anaemia were found to be 38% in men, 65% in women, 56% in pre-schoolers, 68% in primary school children and 73.7% in pregnant women. Their blood was analysed for serum iron, folic acid and Vitamin B12. Of the 658 pregnant women studied 47.8% of them had transferrin saturation percent less 15, 47% folate level below 3ng/dl and 4.8% of 352 pregnant

women less than 80pg/dl according to WHO criteria. She had fully researched into various aspects of nutritional anaemia amongst population groups, therapeutic trails etc. and was responsible with WHO assistance for persuading the UNFPA to provide iron and folic pills for 5 years (1974-1980) for approximately 180,000 pregnant mothers, a year and thereafter by UNICEF. An evaluation was carried out in two areas to determine its efficacy. Culminating in her comprehensive research on nutritional anaemia, she was appointed a temporary WHO consultant to a high-level consultation nutritional anaemia WHO South East Asian Region, New Delhi - SEA/NUT/W 10/1973. She presented a paper on the subject and at the 2nd Asian Nutrition Congress in the Phillipines.

She was trained in 1964 with 24 representatives from 14 South East Asian countries, for 3 months at a high level nutrition training course sponsored by WHO/FAO at Bangkok, Thailand the leader of the course being B.S.Platt the Professor of Nutrition of the London School of Hygiene and tropical Medicine. In 1965 she obtained a place under Prof. Platt to sit for the PhD., but unfortunately her eldest son developed an Osteogenic sarcoma and she proceeded with him to London for treatment. While there Prof. appointed her as a temporary lecturer to the Diploma course in Nutrition at the London School of Hygiene & Tropical Medicine and when her son died she returned home without obtaining her qualifications. She had however gained valuable experience working at this Nutrition Unit for five months and also during the Diploma course in Nutrition which was mostly for students from developing countries, 2 of them – Dr.Solon of the Phillipines and Dr. Mielelema of Tanzania are now foremost in nutrition activity in their respective countries. Professor Platt told her to go home and do her best as what she has learnt was more than adequate.

In 1967 she presented a Government paper on the problem of Goitre in Ceylon at the first WHO sponsored seminar on Endemic Goitre in South East Asia in New Delhi. As a result UNICEF sponsored iodisation plant was set up in the North but due to objections was not utilised.

She studied the food consumption patterns of Sri Lankans for over 40 years. She was especially proved to be associated with the Director of Census and Statistics L.N.Perera in a landmark first Socio-economic (apparent food consumption) Survey in 1969/70 in Ceylon in Asia which revealed the genesis and extent of protein energy deficiency malnutrition, anaemia (haem iron), vitamin A (retinal), riboflavin and calcium at low income levels in spite of food subsidies, published as a special report by the Census and Statistics.

In 1970 she represented the Government at the Second World Food Congress at the Hague and in 1974 the First Population Congress at Budapest. The Sri Lankan Journalist Tarsi Vittachi and she jointly made a statement that Sri Lanka must provide the fishing rod instead of the fish to the large undernourished low income rural population.

In 1971, she presented a paper on the need for weaning (complementary) foods for Sri Lankan infants at the First Asian Nutrition Congress in Hyderabad. Mr. Cifrino, Head of US Aid, India who Chaired the Sessions kindly made available 100 kgs of PKFM for a pilot study organised by the Ministry of Health and CARE in 5 districts called the Community Nutrition [Child] Project feeding 100 infants at each centre with 50 g of PKFM powder and weighed and monitored on a special child health card which was given to the mother for her correct understanding of weaning and the child's progress.

Sri Lanka was very fortunate that the Americans had perfected the technique of adding retinol palmitate to non fat dried milk in the late 1940s, a cheap product, the answer to protecting children against keratomalacia in poor countries was freely made available to every child from 1 year to 5 years through the MCH programme fed on site or take home, depending on the available service, and all pregnant and lactating women and all primary school children fed at school or take home for 16 years from the 1950s to 1970 at a cost of a billion. This programme was executed by CARE and obtained through the US PL480 programme.

In 1972 she attended a Consultative Meeting on Xerophthalmia in Hyderabad, India and presented a paper on Xerophthalmia in Ceylonese children. The meeting was interested to know how Sri Lanka had reduced the prevalence of Keratomalacia as a cause of blindness in children from 60% (Nichols) 44.04% (de Silva KTG) 28.6% (Sivasubramanium P) 7% and 0.2% (Vythilingam A) in 1930s, 1940s, 1950s, 1960s, up to 1970s respectively, which she explained was the programme that was responsible as given above.

However in the global and local food and fuel crisis in 1972/73 this product was withdrawn earlier and keratomalacia came back again in 1994. 3 in 10,000 pre schoolers in 4 poor districts CARE with the Helen Kellar Foundation provided a mega dose (100,000 IU vitamin A) for 500,000 children 1 – 6 years in 4 of the worst affected districts for 2 years but as the programme was not a full success, the National Nutrition Thripasha Programme of the MOOH and CARE came into operation

providing the full vitamin A requirements of a child of 3 years (400 micg retinol) with 10 gram of reference protein 207 kilo calories of energy and all the required minerals and vitamins for daily fed on site or take home.

Dr. Jensen of the consultative group of Colorado State University, under USDA determined the formulation and energy, protein and micronutrient requirements for blended foods for the National Nutrition Supplementary Thriposha programme for mothers and children based on the diet of the poor according to Recommended Allowances in 1973/74. The data was also studied from the point of view of agricultural production targets and wrote the section of Nutrition and Agriculture with Prof. Yogaratnam for the ESCAP Report on Sri Lanka in 1976.

Nutritional Evaluation of blended foods, WSB, ICSM, CSM made with a low-cost extrusion was carried out and the results suggest the utility of this extrusion in providing low-cost nutrition blended foods for use in supplementary feeding programme.

When the first comprehensive island-wide supplementary feeding scheme known as the Thriposha programme for the vulnerable population was launched with the objective of combating protein-energy malnutrition (PEM) and micro-nutrient deficiencies of iron, iodine and vitamin A of mothers and children. She was given the onerous task of co-ordinating this programme monthly from allocation, monitoring and evaluation in over 1000 health centres, 760 estates, Probation and Child care centres, 3 Mahaweli centres, 5 Janasaviya centres and 8 Non Government Organisation clinics, and throughout the country which she was quite conversant with. In the wake of promoting this campaign she had to traverse the length and breadth of the country and she became a force to be reckoned with in the health sector. She earned a great reputation through sheer dedication and great endeavour. This is proved by the fact that even today when any officers of the younger generation go to any part of the country in connection with any health activity and say that they are from MRI her contemporaries still inquire about her. This shows what a charismatic character she has been!

Dr. De Mel's biggest contribution to nutrition has been her real understanding of research on maternal nutrition. Her earlier studies on weaning using local foods were not a success especially in children born low birth mostly those born full term at 2000g. She was convinced that the root cause lay in programming itself in the 1980s. She first started studying the factors contributing to low birth using the WHO/MCH/82.2 study report. The study was done at the LCES NGO programme in the

slums and shanties of Colombo North in 1984-86. The most significant cause was found to be due to low weight gain which was found to approximate in size to smoking as a cause in the industrialised countries. Low pregnancy weight came next with ethnic factors included. Stunting or short stature or small parental size was not the main causes of low birth infants. Presented these results in 1987 to the Nutrition Society as many were of the view that nothing must be done if stunting is the cause. The WHO advisor was of the opinion that we should not dwell on ethnicity because it is really a poverty problem that overrides all other issues. Next she presented the findings of the dropouts from schools of 23 girls and 28 boys who were born low birth weight in the ICES Programme. The boys and girls weight and height were below -3 SD (NCHS) up to 5 years of age and then slowly moved slightly upwards to -2 SD (NCHS) up to 13 years of age but they were still under nourished. These results were presented to the Nutrition Society at their Annual meeting.

She was now firmly convinced that low birth weight must be eliminated and started on research to determine if food intervention to pregnant mothers could reduce low birth weight. Extensive studies carried out on maternal nutrition during pregnancy in relation to weight gain in pregnancy, birth weight and percentage at low birth weight throughout the Island over 6 years. Her most significant finding was the depressing difference between the upper and lower socio-economic groups of pregnant women in the urban city of Colombo in mean weight gain 11.6kg and 4.5 kg, birth weight 3.3kg and 2.6kg and percentage of low birth weight 2 and 30 respectively. Designed a growth-monitoring card during pregnancy for research study in the Urban Slum of Henamulla under Lasallian Community Education Services (LCES) project. A longitudinal study of a cohort of 157 poor pregnant women to understand the causality of low birth weight by food supplementation using the BMI classification was conducted. She used the International Dietary Energy Consultative Group (IDECG) Body Mass Index (BMI) as a good parameter to grade Chronic Energy Deficiency (CED) on the cut-off point recommended that CED III severe BMI >16 , CED II moderate BMI $16 > 17$, CED I mild BMI $17 > 18.5$ and total > 18.5 % CED normal BMI $18.5 > 20$, CED normal BMI $20 > 25$, CED Obese BMI < 25 and all included BMI < 18.5 % since they were eating only 2 meals, one meal of rice and Hathmalu providing 500 kcals, and 24 g of protein were supplied. They were persuaded to come daily for the last 180 days of their pregnancy by providing cloth to sew their babies layette. The groups were evenly matched in age, parity, and race, except in CED III and CED II there were 5 teenagers who did not come regularly and their average weight gain was 4.5 kgs. The low birth weight percentage was found to be as a result 38.3% in CED III and 37.5 % in VED II. Percentage low in CED I was 14.7 %. Percentage of low birth weight > 18.5 was 29.1 %. The percentage of low

birth weight in the cohort was 19.7 % while previously it had been in the range of 29 %. There were 27 low birth weight babies and 14 babies were 250 g less at 2250 g were able to ride the pathway to catch up moving up to the 50th centile in weight, length and head circumference. The 13 low birth weight babies with birth weight of around 2000 g were growth retarded, below 3rd centile in weight below 10th centile in both length and head circumference.

Since the low birth weight rate is unconscionably high even with the Thripasha programme, the results of this study was brought to the notice of the Ministry of Health and CARE. The Tripasha programme was revamped with the accent on maternal nutrition with Thripasha supplementation increasing weight gain by 10 kgs and reducing low birth weight to >10 by the year 2002. The weight gain card used was the Japanese card used 50 years earlier by them after the war to present low birth weight. 10 workshops were held to cover the 5 districts of the country where all health personnel from ODLs to MOHs. CARE printed 700,000 weight gain charts and provided electronic scales to all centres. This programme cost over one million rupees and was effective in setting the Thripasha distribution on the right path.

At a high level consultation on nutritional anaemia in the WHO South East area Region, New Delhi she presented a paper on the subject and at the 2nd Asian Nutrition Congress in the Philippines in 1973, the 3rd Asia Congress in Indonesia in 1978 on Nutrition Education in Sri Lanka. In 1976 she had the privilege of not only attending the first workshop on low cost extrusion products at the Colorado State University, USA and subsequently in 1979 the 2nd Low cost extrusion product workshop at Dar-se-alam, Tanzania. At which she presented papers on the effectiveness of the Thripasha programme on combating undernutrition in the mother, infant and pre school child in Sri Lanka.

As Coronary heart disease is the chief cause of death in Sri Lankan males. She studied the major determinants of energy balance between intake and calorie expenditure, the type and quantity of dietary fats, its degree of saturation and cholesterol content, type of proteins, carbohydrates and fibre in the different life styles of our urban, rural and estate upper and lower income groups. She found that the amount of cholesterol in the daily diet of the upper income group in the estate sector was very high at 477mg and very low in lower income group of all sectors never more than 40mg. In both upper and lower income groups saturated fat content was around 70% of total fat. But the

difference was due to the consumption of animal fat (beef, pork, mutton etc.) by the upper income group and as low as 6 mg in the urban poor.

The data was presented at an international seminar at the Institute of Fundamental Studies on Coronary Heart Disease in Sri Lanka in April 1988. Since then have presented many educative messages on many subjects and also on the prevention of heart disease in the Island Newspaper over 8 years and 8 years previously in the Sinhala Dinamina.

She in collaboration with her associate research workers in the MRI where she had been researching for 38 years, found that under nutrition leading to low birth weight babies and delayed weaning that continues under nutrition throughout preschool and even primary school through drop outs. This has been haunting her right throughout her career and even after her retirement she still works in the LCES project to help improve the nutritional status of the urban poor with HOPE as the LCES being an Educational set up, lifts the urban poor youth both boys and girls to heights of achievement not thought possible.

Thus, her achievements are innumerable and her illustrious career is worthy of emulation. In recognition she deservedly was awarded on 21st May 1992 the rank and dignity of Vidyajyothi by the President of the Democratic Socialist Republic of Sri Lanka.

The President and members of The Zonta Club of Colombo bestowed on her "The Women of Achievement in Science and Technology" in 1989 By Dr. Arthur C.Clerk.

The award was presented in appreciation of her dedicated service to the Mother and Child of Sri Lanka by the Director, CARE in 1993.

Last but not least she was appointed to the Dignity of Sevajothi on 8th July 2000 by the Chairman of National NGO Council of Sri Lanka.

Dr.Renuka Jayatissa (MBBS, MSc, MD)