

OBJECTIVES OF THE WORKSHOP

1. To provide an update on the current scenario of NCDs.
2. To identify the steps required to promote healthy diets in populations.
3. To focus on issues of availability, affordability, accessibility and acceptability of four important dietary components essential for promoting health in populations, namely, promoting the consumption of vegetables and fruits, whole foods and coarse grains, and healthy oils, promoting healthy processing of foods and reducing the intake of salt and trans fats.
4. To discuss the feasibility of implementation of the recommended policies by the government.
5. To formulate action plans for various settings based on the recommendations of the workshop.

INAUGURAL SESSION

The inaugural session began with a welcome address by Prof. Uliyar V Mani, Head, Dept of Foods & Nutrition, The Maharaja Sayajirao University of Baroda, and Co-ordinator, WHO Collaborating Centre and UGC-DSA Program. Prof. Mani gave an overview of the department and the research carried out by it in the area of NCDs. He also elaborated on the theme of the workshop and the expected outcome.

Dr. Bela Shah, Senior Deputy Director General, and Chief, Division of NCD, Indian Council of Medical Research, congratulated and complimented the Department of Foods & Nutrition, for their meticulous research in the area of control of NCDs and for accepting the challenge of organizing this workshop. Dr. Shah also reiterated the need for the workshop.

Dr. Cherian Verghese, Co-ordinator (NMH), WHO India Country Office, stressed on the rising epidemic proportions of NCDs in the country and underlined the need to evolve strategies to prevent and control it.

Prof. Srinath Reddy, Head, Dept. of Cardiology, All India Institute of Medical Sciences, accentuated the role of nutritionists in the prevention and control of NCDs and highlighted the need for various sectors, government and non-government, to work collectively towards this.

Dr. Prerana Mohite, Dean, Faculty of Home Science, The Maharaja Sayajirao University of Baroda, praised the Dept. of Foods & Nutrition on its capabilities and for hosting the workshop, the recommendations of which would benefit the community at large.

Dr. Mrunalini Devi Puar, Chancellor, The Maharaja Sayajirao University of Baroda, graciously inaugurated the workshop. In her inaugural address, Dr. Puar highlighted the growing problem of NCDs and the importance of controlling it.

TECHNICAL SESSIONS

Speakers

- ◆ **Dr. Cherian Verghese, Co-ordinator, (NMH), WHO, India Country Office, New Delhi.**
- ◆ **Dr. Bela Shah, Senior Deputy Director General, and Chief, Division of NCD, Indian Council of Medical Research, New Delhi**
- ◆ **Prof. K. Srinath Reddy, Head, Dept. of Cardiology, All India Institute of Medical Sciences, New Delhi**
- ◆ **Dr. Pradip Ghosh Chaudhuri, Senior Manager (Production), Agro Tech Foods Ltd., Hyderabad**
- ◆ **Dr. Keshav Kamaliya, Assistant Professor, Anand Agricultural University, Anand**

Diet and Non-Communicable Diseases

Dr. Cherian Verghese, Coordinator (NMH), WHO India Country Office, New Delhi

- The prevalence of NCDs has cut across all socioeconomic barriers and affects all income groups, though the prevalence is lower among the underprivileged sections.
- While the onset of NCDs is gradual, it is alarming to note that a large percent of deaths are because of NCDs.
- There are differences between the treatments required for communicable diseases and non-communicable diseases.
- There is a need for integrating various sectors in the prevention of NCDs was stressed. Example of North Karelia in Finland - where the involvement of various stakeholders – NGOs, media, supermarket, food industries and agriculture, led to healthier dietary practices and reduction in the adult male smoking.
- The various risk factors for NCDs and the recommendations to control them were elaborated.

- There is a need for healthy settings, that is, promoting good dietary habits and increasing physical activity in various settings, such as, workplace, schools, universities, market places, hospitals and in society.
- Discussion is required on a few issues – How to communicate the link between Diet and NCD in the Indian context, how to balance under-nutrition and over-nutrition in the population, What are the facts and principles that we should communicate to the People, Policy level options, and Options for community based interventions.

Current Scenario of Non-communicable Diseases in India: Need for an Integrated Prevention and Control Program

**Dr. Bela Shah, Senior Deputy Director General, and Chief, Division of NCD
Indian Council of Medical Research, New Delhi**

- India ranks second in the countries with the burden of NCDs.
- The global and Indian prevalence figures of various NCDs and the various risk factor involved were enumerated.
- There is a higher burden of NCDs among the urban population as compared to the rural one.
- There is a need for integration at different levels- Disease, Action and System, for making healthy choices.
- Strategies need to be made at Central, State and District levels.
- Implementation of IEC strategies, including standard media packages is needed.
- A NCD cell is required in the Ministry
- Feasible plans of action for overcoming the problem of NCDs should be developed.

Diet and Physical Activity - From Global Evidence to National Action for Prevention and Control of Non-communicable Diseases

Dr. K. Srinath Reddy, Head, Dept. of Cardiology, All India Institute of Medical Sciences, New Delhi

- A health transition has occurred in India since 1990, with NCDs being projected as the leading cause of deaths by 2020.
- The premature deaths lead to loss of potentially productive years of life, which is much higher for India (9.2% in 2000, 17.9% by 2030) as compared to the USA (1.5% in 2000, and 2% by 2030).

- Risk operates in a continuous manner, and when multiple risk factors co-exist, the overall risk is multiplicative.
- The key issues involved with various dietary components related to NCDs, the role of each of the dietary components, modifications required, promotional strategies, and the need to develop settings specific action plans was elucidated.
- The need for an enabling environment for NCD control involving various sectors was underscored.
- There is a need to develop a national strategy on diet and physical activity for preventing and controlling NCDs.

Challenges in Reducing Saturated and Trans Fat - Role of Industries

Dr. Pradip Ghosh Chaudhuri, Senior Manager (Production), Agro Tech Foods Ltd., Hyderabad

- The role of fats in human nutrition with special emphasis on trans fatty acids was highlighted.
- Newer insights were given on the inter-esterification process which gives zero trans fats.
- Blends of oils are required to give the ideal fatty acid profile.
- The role of oryzanol present in rice bran on serum lipids was documented. However, it was emphasized that oryzanol is lost with standard chemical refining, but is retained with physical refining. Therefore, it is equally important to mention on the label the method of refining used for rice bran oil.
- The focus of oil industry should be on creating and catering healthy products.
- People from the field of medicine and nutrition should work jointly with industry in increasing the awareness of consumers on right selection of dietary fats and correct advice to avoid harmful food ingredients.

Challenges the Food Industry has in Promoting Healthy Processing of Foods

Dr. Keshav Kamaliya, Assistant Professor, Anand Agricultural University, Anand

- The need to develop healthy food products to combat and prevent chronic diseases was stressed.

- The development and marketing of various healthy food products such as sugar free products, low sodium bakery products, low calorie products, gluten free products and functional foods incorporating unconventional food sources, was suggested.
- Development of innovative ways to preserve nutrients during processing was recommended.

GROUP DISCUSSIONS

The workshops participants, the invited speakers and resource persons formed the four working groups. The objectives of the working groups were to recommend the strategies that could be applied to promote healthy diets in population.

The first working group deliberated on the possibilities of increasing the availability, accessibility and acceptability of promoting optimal (>500g daily/capita) levels of vegetables and fruits. The group discussed the roles and responsibilities of various stakeholders in ensuring optimal intake of vegetables and fruits in populations. The group recognized the bottlenecks and therefore recommended convergent actions by all the stakeholders and the possibility of putting in place a monitoring system for self as well as peer group evaluations to ensure realization of goals set by the group.

The second group considered the issues of promoting coarse grains and whole foods by the populations. The group emphasized the need to preserve traditional practices in populations and the steps required to discourage the consumption of refined foods.

The third group discussed the harmful health consequences of consuming processed foods, it was also realized that with the changing lifestyles and women opting for outside employment consumption of processed foods may be a necessity; therefore, it is important that food is processed in a healthy manner. Therefore, this group discussed the methods by which various stakeholders could form partnerships to promote healthy processing policy for processed foods and to ensure that the consumer is able to make informed choices.

The fourth group deliberated on the strategies for reducing trans fats in diets and promote healthy blends of oil in populations. Earlier, in the technical session it was elaborated that the technology exists for virtual elimination of trans fats in processing and therefore the

need to provide incentives to the industry for adopting good manufacturing practices, specially by the bakery industries who are the biggest users of trans fats. The need was also felt to censor the health claims by health authorities to prevent misinformation to the consumers.

Although the four major dietary components important for NCD prevention were focused in the workshop, it was well recognized that there are many aspects of diet which need to be promoted for ensuring health of populations at the household, population, community and settings level. Recognizing widespread nutrition illiteracy in populations, all the groups felt the need to have dieticians and nutritionists playing an active role in implementing dietary guidelines for healthy living with a life cycle approach. The group strongly recommended a paradigm shift in the government's programs and policies to give importance to prevention for sustainable development and envisaged a greater role of nutrition professionals in health promotion and suggested changing existing or framing new policies for appointment of nutrition professionals in various programs and settings to utilize a great untapped trained human resource for the national development.

The recommendations given by all the groups were presented in the workshop. The key recommendations of all the four working groups are summarized in Table 1.

Table 1 : Recommendations to Promote Healthy Diets

Partners	Increasing consumption of optimal levels of Veg and Fruits	Increasing consumption of whole foods and coarse grains	Decreasing consumption of salt, trans fats and sugars, refined foods	Promoting healthy blends of oils
Government	1. Establish Public Policy for promotion of optimal levels of Veg and Fruits across life span. 2. Generate local information base for action 3. Ensure availability,	1. Improve Acceptability in Urban and Rural areas by Media 2. Increase availability and consumption of coarse grains and whole foods in all the areas. 3. Encouraging	1. Generate local information base for action 2. Sensitize food Industries of their social responsibility. 3. Design and implement strong healthy processing and food labelling	1. Encourage domestic production of healthy oils 2. Provide subsidies to grow healthy oil seeds. 3. Frame import policy for ensuring availability of deficits in

	<p>accessibility and acceptability to all sections of society by focusing on inter sectoral linkages.</p> <p>4.Sensitization of all Stakeholders for convergent actions</p> <p>5.Regulate export of vegetables and fruits at the cost of their local availability</p> <p>6.Set up a system for coordination of key stakeholders and review progress every six months.</p> <p>7.Set up a Surveillance and monitoring system</p> <p>8.Give buy back guarantee to farmers for crop produced at pre set costs.</p> <p>9.Focus on promoting veg and fruits in a campaign mode in all the seasons with celebrity endorsements.</p>	<p>cultivation of these crops versus cash crops (crop rotation, incentives/dis-incentives/timely and adequate returns to farmers)</p> <p>4.Encourage and promote traditional foods and cooking practices</p> <p>5.Ensure availability of whole foods and coarse grains at affordable prices at all the outlets including PDS</p> <p>6.Encourage functional food development (Increase fibre) by subsidies and tax holidays</p> <p>7.Encourage universal fortification/enrichment of whole wheat flour.</p> <p>8.Regulate export of food items outside at the cost of their local availability</p>	<p>policy for all important nutrients.</p> <p>4.Design uniform guidelines for nutrition certification like AGMARK for all food products</p> <p>5.Include nutrition safety in food safety regulation bodies (HACCP)</p> <p>6.Levy heavy taxes on non certified products and incentives for certified products like tax holiday for some years, subsidy on healthy processing equipments</p> <p>7.Encourage/, provide incentives for virtual elimination of trans fats from market</p> <p>8.Amend PFA for including more than 2 oils, for optimal Fatty Acid profile .</p> <p>9.Promote intake of non traditional ALNA (n-3) rich food everyday (perilla/flaxseed)</p> <p>10.Promote fish</p>	<p>local production.,</p> <p>4.Give custom duty and tax benefits for importing oilseeds to meet demands, if local produce not enough</p> <p>5.Ensure availability of blended oils at affordable prices at all the outlets including PDS</p> <p>6.Build capacities of local oil producers to blend oils appropriately .</p> <p>7.Give buy back guarantee to farmers for crop produced at pre set costs.</p> <p>8.Make blends of oil available as sachets to prevent adulteration</p> <p>9.Discourage unhealthy oils in all</p>
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	<p>(Create conducive environment to initiate and maintain behavior change)</p> <p>10.Prevent post harvest losses by encouraging their healthy processing and discourage processing which makes them unhealthy</p> <p>11,Develop guidelines, tools for specific actions</p> <p>12.Capacity building and related technical support</p> <p>12.Leadership and training, human resources development</p> <p>13.Partnerships/networks (relevant stakeholders agree on (and are prepared to invest in) a coherent and comprehensive approach)</p>	<p>9. Improving availability of food not locally produced throughout the country, in view of migrating populations</p> <p>10. Discouraging production/consumption of refined foods.</p> <p>11. Partnerships/networks (relevant stakeholders agree on (and are prepared to invest in) a coherent and comprehensive approach)</p>	<p>and whole nuts intake after improving its accessibility and affordability to all sections of society.</p> <p>11.Discourage selling of fishing rights outside the country.</p> <p>12.Build a system of procuring fish from fisherman and making it available to all consumers</p> <p>13.Develop color codes for healthy /unhealthy foods or industries With warnings about over-consumption hazards</p> <p>14.Partnerships/networks (relevant stakeholders agree on (and are prepared to invest in) a coherent and comprehensive approach)</p>	<p>food processing and food manufacturing units, including local caterers, traditional sweets makers, hospitality and in all bulk consumers of oil.</p> <p>10.GMP can be introduced in hospitality sector</p> <p>11.Centralize the distribution of healthy oils to Hospitals, Tourism department's hospitality centers, Armed forces and Industries.</p> <p>12.All food and beverage advertisements to be scrutinised by committee consisting of various technical experts to prevent misleading</p>
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				<p>and wrong messages Design Code of conduct for advertisements targeted to children</p> <p>13.Partnerships/ networks (relevant stakeholders agree on (and are prepared to invest in) a coherent and comprehensive approach)</p> <p>14.Change norms for Nutritional Labeling (Include trans fat, Fatty acid profile)</p> <p>15.Govt. regulation of health Claims</p>
Industry	<p>1.Prevent post harvest losses by healthy food processing techniques (Packed, clean ready to eat salads)</p> <p>2.Support innovation in techniques for</p>	<p>1.Promote traditional foods</p> <p>2.Incorporate or invest in development of whole foods, functional foods to increase healthy components in food</p>	<p>1.Promote large scale production of low sodium potassium and iodine enriched salt at affordable costs</p> <p>2.Improve sales of healthy foods by social marketing</p>	<p>1.Oil manufacturers to be sensitized and capacities build for appropriate blending.</p> <p>2.Self regulation of</p>

	rural and tribal market	<p>manufacture.</p> <p>3. Aggressive marketing (Popularize, inform and market) of functional /healthy foods</p> <p>4. Improve Taste, Presentation and Ease of consumption of functional foods</p> <p>5. Facilitating storage and equitable distribution via PDS/network of cooperative societies/transportation</p>	strategies 3. Innovate and produce healthy processed foods	health Claims.
Cooperatives	1. Partner with government/industry to improve availability, affordability and acceptability by actions at the farmer's level	<p>1.. Facilitating storage and equitable distribution via cooperative societies</p> <p>2. Partner with industry for quick transportation</p>	1. Support marketing of healthy processed foods	1. Support marketing of healthy blends of oils
Civil Society	Social Mobilization Consumer forum ---- Advocacy/		Nutrition literacy campaigns – no promotion of particular type of industry. right to know about each component of food/type of oil used	
Media	1. Social mobilization (Awareness,	1, Design awareness campaigns on benefits.	1. Make health a marketable commodity and increase	1. Advertisements celebrity endorsements, role models,

	<p>change perception)</p> <p>2. Advertisements for promoting veg fruit intake</p> <p>3. Aggressive marketing (celebrities)</p> <p>4. Sustained and adequate communication</p> <p>5. Consistent messages are given from a wide range of players over a longer span of time;</p>	<p>2. Overcoming barriers of associated social status esp. in lower income groups by celebrity endorsements</p>	<p>nutrition awareness for judicious selection of processed foods</p> <p>2. Code of conduct for advertisements targeted to children</p>	<p>mass media</p> <p>2. Code of conduct for advertisements targeted to children</p>
<p>Health Educators consistent messages are given from a wide range of players over a longer span of time for healthy diets</p>				
Academia	<p>Research, Use available data, Document the current consumption patterns of all important dietary components, Superimpose dietary survey results if any, Identify the gaps, Advocacy etc.</p>			
Professional health organizations	<p>Sensitization and Modified recipes (ready to eat foods)</p>			<p>Advocacy channels- etc.</p>
Settings	<p>Local stakeholders play an active role (schools, restaurants, shops, local food producers/farmers, local media, local Government...)</p> <p>Regulate school college canteen</p> <p>Include at least 1 hr of physical activity in school games</p> <p>Incorporate healthy messages in school Curriculum</p> <p>Work place provisions, Develop nutrition policy for all staff and family members, link medical reimbursements with healthy diet and lifestyles. Improve canteen meals and snacks after surveillance of risk factors and sensitizing the staff at all levels</p>			

PANEL DISCUSSION

Overview of the recommendations of the panel discussion

- Encourage healthy traditional food practices.
- Sensitize the community regarding healthy diets.
- Enforce nutritional labeling.
- Include a variety of food items in fair price shops/public distribution system, including vegetables and fruits.
- Schools may be used as an important sector for health activities.
- Implementation of key nutrition health messages through various modes such as key messages on shop bills, circulars, diaries, etc.

NEED ASSESSMENT

In order to make the recommendations feasible, it is necessary to identify the areas where information gaps exist. The need assessment areas identified are given in Table 2.

Fruit and Vegetable Atlas

Information on the availability of vegetables and fruits in different seasons and regions needs to be collected and compiled. This will help in devising strategies for increasing the consumption of vegetables and fruits. Also, it is necessary to obtain information on the indigenous vegetables and fruits consumed in different areas, and how the consumption of these can be promoted in other places.

Sources of Trans-Fatty Acids

The foods which contain trans-fatty acids need to be identified. There is also a need to classify these foods according to the trans-fatty acid content. All trans-fatty acid foods should be appropriately labeled.

Pesticides Content of Foods

The pesticide residue in vegetables, fruits and grains, in different parts of the country, need to be ascertained, for advocacy purposes.

Nutrient Content

The existing database on nutrient content of foods, needs to be updated, particularly the sodium and potassium content.

Post Harvest Losses

Strategies to reduce post harvest losses of vegetables, fruits and grains, need to be evolved, for optimum utilization.

Table 2: Information Gaps Identified

Components	Information Regarding				Processed Foods
	Vegetables & Fruits	Coarse Grains	Trans Fats	Healthy Oils	
Atlas – Availability and Consumption Pattern					
▪ State wise	√	-	-	√	-
▪ Season wise	√	-	-	-	-
▪ Indigenous	√	√	-	-	-
Sources	-	-	√	-	-
Pesticides	√	√	-	-	-
Sodium Content	√	-	-	-	√
Potassium content	√	-	-	-	√
Post Harvest Losses	√	√	-	-	-

TRANSLATING THE RECOMMENDATIONS INTO ACTION

In order for the recommendations to be implemented it is necessary to evolve strategies/action plans to enable people to make healthy dietary choices. The conceptual framework to control NCD's through diets is given in Figure 1.

A concerted multisectoral effort is required to bring about long term changes in attitudes and behaviour both at the individual and community level. An integrated approach involves focused action by various regulators in different stages of the food chain, from production to consumption. Table 3 gives the details of the actions to be taken at each stage and the key regulators involved.

Figure 1 : Conceptual Framework to Control NCD's Through Diets

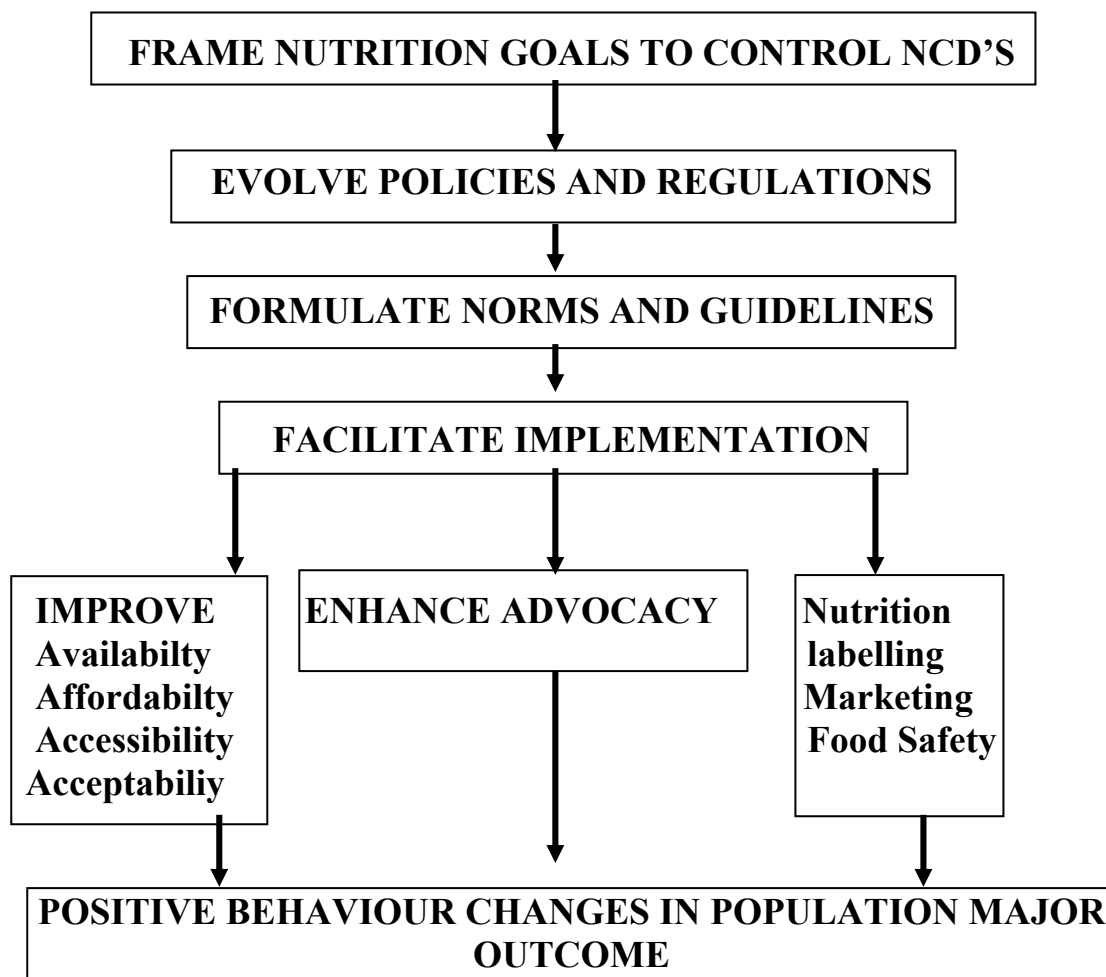


Table 3 : Action Plan - An Integrated Approach

Component	Action	Key Regulators
PRODUCTION	<ol style="list-style-type: none"> 1 Build a database- State & Season wise 2. Increase the Production to meet the demand 3. Earmark and Expanding the Land area for Cultivation 4. Decrease Post Harvest Losses 5. Incentives for the Production of Healthy foods 6. Cess on the Production of Healthy foods 7. Regulate the use of Pesticides and minimize Contaminants 	Ministry of Agriculture Ministry of Finance Ministry of Food Industries Farmers/Agriculturists Model Farms
STORAGE	<ol style="list-style-type: none"> 1. Create adequate and appropriate storage places near production 2. Prevent misuse of Preservatives and Contaminants and chemicals for ripening 	Food Safety Regulators Ministry of Agriculture Ministry of Food and Civil Supplies
TRANSPORT	<ol style="list-style-type: none"> 1. Improve Logistics 2. Subsidy to provide healthy foods in remote areas 	Ministry of Food and Civil supplies Ministry of Transport
DISTRIBUTION	<ol style="list-style-type: none"> 1. Evolve feasible distribution network 2. Regulate and Monitor PDS 	Ministry of Food and Civil supplies Food Safety Regulators

Table 3 : Action Plan - An Integrated Approach (continued)

Component	Action	Key Regulators
FOOD PROCESSING	<ol style="list-style-type: none"> 1. Decrease the Post Harvest Losses 2. Encourage Healthy processing 3. Facilities and Subsidies to upgrade Technology for Healthy Processing 4. Eliminate the use of Trans Fatty acid 5. Develop Low Sodium Products 6. Formulate High Fibre Products 7. Preserve Nutrients 8. Incentives to develop Designer foods using unconventional healthy foods 9. Enforce Food Labeling and Healthy Food Color Code system 10. Food Safety Regulations & Quality Control Measures 11. Good Manufacturing Practice Certification 	<p>Ministry of Food Industry Ministry of Food and Civil Supplies. Ministry of Finance Food Technologists Nutritionists Ministry of Health Food Safety Regulators</p>
MARKETING	<ol style="list-style-type: none"> 1. Guidelines for Advertisement and Health Messages 2. Right to Correct Information 3. Encourage Promotion of Healthy Foods 4. Evolve Strategies to Ensure Availability, Affordability and Accessibility to Healthy Foods 	<p>Ministry of Health Ministry of Finance Ministry of Information and Broadcasting Advertising Council of India Nutritionists Educationists</p>

Table 3 : Action Plan - An Integrated Approach (continued)

Component	Action	Key Regulators
ADVOCACY	<ol style="list-style-type: none"> 1. Mass Media (TV spots, Radio spots, Newspaper, Articles) 2. Posters/Leaflets/Brochures- Distribution of Informative materials 3. Nutrition-Health Club Meetings with interactive sessions at National and International Clubs, School, Community, Garden-Club and University Club. 4. Social Marketing 5. Celebrity endorsements 6. Role Models and Icons 7. Captions and Slogans at strategic points 8. Competitions (Recipes, Debate, Quiz etc) 	Ministry of Information and Broadcasting Ministry of Health Ministry of Food and Civil Supplies Advertising Council of India Nutritionists Educationists Ministry of Social Welfare Media Agents
REGULATION AND MONITORING	<ol style="list-style-type: none"> 1. Norms for the Food Industry 2. Pesticide Residues 3. Packaging guidelines 4. Uniformity in Labeling and Healthy Food Color Code system 5. Punishment to those involved in Adulteration 6. Correctness of the Advertisements/Messages 7. Rights to Consumer Forum 	Ministry of Food and Civil Supplies Ministry of Health and Family Welfare Controller of Food and Drug Adulteration Act Advertising Council of India

It is equally important to create an enabling environment for people to achieve and maintain healthy dietary practices. This can be done by addressing issues related to healthy dietary components in different settings. Table 4 outlines the actions required to be taken in various settings to combat the problem of NCD's. The steps required to achieve this in the different settings is shown in Table 5.

Table 4 : Action Plan In Different Settings

Settings	Enabling Environment
WORKPLACE	<ul style="list-style-type: none"> • Healthy Menus • Discourage reuse of oil • Replace high fat snack packets with healthier foods • Eliminate the use of Vanaspati • Quality Control for Food Safety • Regular Health-Nutrition Screening • Posters with Nutrition-Health messages • Dissemination of information through Handouts, Brochures, Leaflets etc • Health Club Meetings • Ladies Club (Talks, Healthy recipe Competitions etc) • Onsite facility for physical activity • Family sports day
EDUCATIONAL INSTITUTES	<ul style="list-style-type: none"> • Healthy Menus • Ban on sale of Junk Foods in Canteens and Tiffin Boxes • Health & Nutrition Debates, Talks, Quiz • Posters/Handouts/Leaflets/Stickers • Capacity Building of Parents and Teachers • Introduction and Monitoring of Nutrition Health Assessment Card • Promotion of Kitchen Garden for School Lunch Programme • Maintenance of Cleanliness and Hygiene • Wherever possible encourage walking and use of Bicycle as mode of transport • Encourage Physical Activity 3 times a week
HOSPITALITY	<ul style="list-style-type: none"> • Informed Menu Choices • Promotion of Healthy Foods • Introduction of Health Foods Counters • Quality Control Measures for Food Safety • Good Manufacturing Practice Certification • Strict Legislature to a) Prevent use of Vanaspati b) Reuse of Oil c) Use of Leftovers • Storage of Foods at appropriate Temperature • Food Safety measures with regard to a) Raw ingredients b) Storage Places c) Processing d) Personal • Appropriate posters with key messages • Capacity building of the employees for food safety , hygiene and nutritional aspects

Table 4 : Action Plan In Different Settings (continued)

Settings	Enabling Environment
COMMUNITY	<ul style="list-style-type: none"> • Creating Nutrition Health Awareness with the help of Mass Media, Posters, Handouts, Leaflets, Debates etc • Local Club Meeting (Talks, Interactive session, competitions etc) • Nutrition Health Screening • Rights to Consumer Forum • Each Locality to have its own Community Park, Market Place for fresh supply of Fruits and Vegetables and Grocery Stores • Maintenance of Cleanliness • Sensitize about Food Labeling • Encourage Kitchen Garden wherever possible
FOOD INDUSTRY	<ul style="list-style-type: none"> • Good Manufacturing Practice Certification • Subsidy for up gradation of Technology for Healthy Processing of Food • Food Safety Regulations at every step • Healthy Marketing Practices



Table 5 : Promotion of Healthy Diets in Various Settings

Components
<u>Formative Research</u> 1. Related to Diet <ul style="list-style-type: none">▪ Perceptions▪ Attitudes▪ Practices 2. Determinants <ul style="list-style-type: none">▪ Risk factors▪ Constraints▪ Strengths▪
<u>Surveillance</u> <ul style="list-style-type: none">▪ Availability▪ Accessibility▪ Affordability▪ Current Consumption Pattern▪ Logistics▪ Constraints▪ Strengths

Table 5 : Promotion of Healthy Diets in Various Settings (continued)

Components
<p><u>Action</u></p> <p>1. Strategies</p> <ul style="list-style-type: none">▪ Awareness campaigns<ul style="list-style-type: none">- Interpersonal/ Group/Targeted communication- Handouts/Leaflets- Posters- Key messages- Promotion of traditional foods/dietary practices- Promotion of traditional cooking practices▪ Mass media<ul style="list-style-type: none">- News papers- Magazine articles- Advertisements- Radio- Television spots- Celebrity endorsements- Icons- Role models- Advocacy through soap operas/movies▪ NGOs/CBOs <p>2. Policies</p> <ul style="list-style-type: none">▪ Ministry of Health▪ Ministry of Agriculture▪ Ministry of Food and Civil Supplies▪ Ministry of Food Processing▪ Ministry of Finance▪ Ministry of Industries▪ Ministry of Education▪ Ministry of Information and Broadcasting <p>3. Society</p> <ul style="list-style-type: none">▪ Co-operatives▪ Consumer Forum▪ Community <p>4. Guidelines/norms</p> <ul style="list-style-type: none">▪ Nutrition labeling▪ Color codes▪ Healthy foods in canteen/cafeteria▪ Advertisements for products▪ Nutrition and health messages▪ Quality control/Food safety <p>5. Promotion of Physical Activity</p>

KEY SUGGESTIONS

- An apex body needs to be constituted at the Central level to formulate guidelines for the implementation of recommendations and strategies identified to curb the rising epidemic of NCD's.
- Inter-sectoral co-ordination to be established among the various ministries and government departments.
- Integrated approaches need to be adopted to prevent and control non-communicable diseases.
- Appropriate and feasible action plans to be implemented in various settings.

OVERVIEW OF DEPARTMENTAL RESEARCH ON NCDs

The research in the field of medical dietetics continued to focus on important diet related Non Communicable Diseases in India and the interventions to prevent and correct them. Among the South Asian countries, India continues to have a high prevalence of Diabetes, Hypertension and Coronary Heart Diseases and therefore various studies were carried out in these areas.

Our last two decades of work in the research area of Diabetes mellitus has given great insights into understanding the pathobiochemistry of Diabetes mellitus. The salient observations were the presence of dyslipidemia, glycation of proteins with poor metabolic control, imbalances in collagen metabolism along with alterations in uronic acid levels. In order to understand and assess the extent of secondary complications, co morbid interactions at molecular level were looked into. The results revealed that clinical markers along with biochemical indices showed a better picture of the pathophysiology and pathobiochemistry of Diabetes Mellitus, which is essential for the management of disease. A qualitative tool - slab gel electrophoresis was used to look into the structural alterations in the protein. It was observed that total number of bands was less in number (i.e. 4) in diabetics as compared to normals (i.e 7). On destaining greater degree of glycation as well as structural alterations in proteins were seen. Thus electrophoretic mobility of proteins may serve as an additional tool in understanding the development of secondary complications in diabetes.

From the prevention point of view attempts have been made to identify indigenous foods in the management of Diabetes Mellitus. Spirulina, Flaxseeds and Mushrooms have been incorporated in various recipes for determining their glycemic index. Encouraging results have led to indepth clinical trials with flaxseeds and spirulina, which can be used as an effective nutritional supplement in the management of Diabetes Mellitus.

Public health aspects of Non Communicable Diseases include the risk factor analysis of Non Communicable Diseases in different settings such as school, health care, old age institutions and industries. The formative research has generated enough scope for primary prevention of Non Communicable Diseases. Perspectives for future include extension activities such as imparting nutrition health awareness for positive behavioural changes and developing MIS for screening individuals at risk of Diabetes and Coronary Heart Disease.

Work has been done on the following areas of NCD's

1. Metabolic alterations in diabetes mellitus
2. Glycemic Index of traditional Indian foods
3. Indepth clinical trials with nutritional supplements (Spirulina, Flax seeds, Amla) in the management of diabetes mellitus
4. Adolescent Obesity : Magnitude and Risk factor analysis
5. Prevalence of NCD's in different settings – free living and Industrial
6. Development of MIS for identifying individuals at risk for Diabetes Mellitus & Coronary Heart Disease.

Studies on hypertension in the department aimed at first assessing the prevalence of hypertension in Urban Baroda, both in the free living as well as industrial population of Baroda (Situational analysis) and identifying the risk factors for the possible etiology of hypertension. Based on the identified dietary risk factors, attempts were made to study the efficacy of various diet therapies for the management of hypertension.

Since the reported data on the sodium and potassium content of foods was very limited, these being the important nutrients identified as the possible etiological factors for the onset and the prognosis of the disease, it was considered essential to first develop a data bank on the sodium and potassium values of all kinds of foods (Raw, cooked and processed foods),

including drinking water, various types of salts consumed by the population as taste enhancers and cooked and processed foods. Thus, based on these values ready reckoners for the foods that can be consumed freely, moderately, sparingly etc in various types of disorders requiring modification in these nutrients, including hypertension, were developed.

The role of potassium chloride (KCl) in controlling hypertension in confirmed hypertensives in the industrial population of urban Baroda was also assessed. Potassium supplementation with 3.6 gm of potassium chloride daily for one month resulted in a significant shift of subjects from higher categories of hypertension to lower categories, but none reached the normal category. Efficacy of potassium supplementation was more pronounced in untreated hypertensives as compared to those taking anti - hypertensive therapy.

In order, to improve the palatability of low salt diets, which has been reported as a major constraint for the compliance of dietary advice for hypertension, the efficacy of the salt alternative available in the market was also assessed for its sensory qualities and the desirable level of its substitution to make the diets palatable and overcome the biggest constraint in the compliance of the low sodium regimens.

Nine days cyclic menus based on the combinations of more than one nutrient considered important for hypertension management & healthy dietary practices were prepared and tested for its organoleptic (sensory) properties, visual appeal, ease of preparation etc. An information booklet based on the findings of the studies conducted in the department and guidelines for prevention and control of hypertension was developed. The efficacy of the information booklet was then established based on changes in the behavior of the patients and the menus were tested in hypertensive population for their acceptability and compliance in selected patients from private clinics of Baroda.

Since the risk factors of hypertension are similar to the risk factors implicated for the control of non communicable diseases and the emerging trend of rising NCD burden in India, a need was felt to conduct surveillance of the risk factors of NCD's in industrial settings as well as in free living populations by using the standard WHO's STEPS methodology.

Lastly, although a lot has been accomplished in the department, there is a need to begin a campaign to create awareness regarding the prevalence, etiology, consequences of all non communicable diseases as well as specifically targeting, dietary management of hypertension, termed by WHO as a silent Killer and suggest easy to follow diets for its management. Concerted efforts are required to improve behavioral practices of our communities to improve healthy living by adopting healthy diets and lifestyle changes. It is our duty to protect our most productive population (40 –60 years), who is falling to the malady of modernization, industrialization and urbanization.

In future we need to target various settings for the nutrition health promotion. Sensitization of various stake holders will have to be done, in order to change existing or frame new policies, plan and implement programs to ensure promotion of healthy diets and lifestyles in various settings. Efforts will have to be made to ensure convergent actions of all the stakeholders to ensure the availability, affordability and accessibility of healthy dietary components as well as for promoting physical activity in populations.

RESOURCE PERSONS

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4. Dr. Cherian Verghese, Coordinator (NCD & mental health), WHO, Office of the WHO Representative to India, 534 A Wing, Nirman Bhavan, Maulana Azad Road, New Delhi 110011. Phone no. 011 23061955/23062179 Ext. 23133. (M) 9811323042. email verghesec@whoindia.org
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7. Dr. SK Nanda, Principal Secretary, Ministry of Food and Civil Supplies, Govt. of Gujarat, Gandhinagar.

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**Workshop on Role of Diet in the Prevention and Control of
Non-Communicable Diseases 24 -25th January 2006
Venue : Hotel Surya Palace, Lilac Room, 6th Floor, Vadodara**

Programme

Day I

9:00 a.m – 9:30 a.m	Registration
9:30 a.m – 10:30 a.m	Inauguration
10:30 a.m – 11:00 a.m	Tea Break
11:00 a.m – 11:15a.m	Introduction of participants
11:15 a.m – 11:45 a.m	Diet and Non Communicable Diseases Dr. Cherian Varghese Co-ordinator (NMH), WHO India, Country office
11:45 a.m – 12:15p.m	Current scenario of NCDs in India: Need for an integrated prevention and control program Dr. Bela Shah, Senior Deputy Director General and Chief, Division of NCD, ICMR, New Delhi.
12.15 p.m – 1.15 p.m action for	Diet & physical activity: From global evidence to national prevention and control of non-communicable diseases Dr. K. Srinath Reddy Professor and Head, Dept. of Cardiology, AIIMS, New Delhi
1:15 p.m – 2:00 p.m	Lunch
2:00 p.m – 2:30 p.m	Challenges in Reducing Saturated and Trans Fats: Role of industries Dr. Pradip Ghosh Chaudhuri, Senior Manager (Production), Agro Tech Foods Ltd, Secunderabad.
2:30 p.m – 3:30 p.m	Inputs for small group discussion with tea
3.30 pm – 5.30 pm	Small Group Work (For Policy Implications) Points to be covered - Sensitivity to Price - Availability - Acceptability - Advocacy, Control Programme and Campaigns Group I – Increasing Intake of Vegetables and Fruits Group II- Reducing Intakes of Saturated and Trans Fats and Promoting Healthy

Oils
Group III- Increasing Consumption of Coarse Grains and Whole Foods
Group IV- Decreasing the Consumption of Salt and Promoting Healthy Processing of Foods

Day II

9:00 a.m – 10:15 a.m	Healthy processing of foods -Bakery Products Dr. Keshav B. Kamaliya, Assistant Professor, Anand Agricultural University, Anand
10:30 a.m – 11:15 a.m	Presentations and Discussions of Small Group Work Recommendations
11.15a.m. – 11.30 a.m.	Tea
11.30 a.m. – 12.30 p.m.	Small Group Work for Preparing Action Plans for Various Settings
12.30 a.m. – 1.00 p.m.	Presentations of Action Plans
1.00 p.m. – 1.15 p.m.	Overview of the proceedings of the workshop Dr. K. Srinath Reddy Professor and Head, Dept. of Cardiology, AIIMS, New Delhi
1.15 p.m. – 2.30 p.m.	Panel Discussion on Feasibility of Implementation of the Recommendations and Action Plans Given by Small Groups
2.30 p.m. – 2.45 p.m.	Concluding Remarks
2.45 p.m.	Lunch
