# Rainbow behind Diabetic Diet

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# Discussions

- Principles of DM Diet
- Recipe development/modification for the diabetes
- Current dietary trend

# ADA 2009
# Standard of Care – MNT

- Individualized MNT as needed to achieve treatment goals.
- Weight loss for overweight & obese individuals who have or are at risk for diabetes
- Low-CHO or low-fat calorie restricted diets may be effective in the short-term diets (up to 1 year)
- For patients won low-CHO diets monitor lipid profiles, renal function & protein intake and adjust hypoglycaemic therapy as need
- Physical activity & behaviour modification are important components if weight loss programs.

# Special Consideration

- Toddlers
- Adolescents
- Adults
- Pregnancy & lactation
- Older adults
- Individuals with other diseases

# Special Consideration for Diabetic Children

- Requirement for vitamins, minerals, energy and protein are the same as non-diabetic children
- Like non-diabetic children, they have food fads & periods of food refusal & may try to use food to manipulate their cares
- All children show tremendous day-to-day variations in energy expenditure

# Diabetes & Pregnancy

***Gestational DM***

- To meet the increased nutritional requirements of pregnancy
- Monitor weight gain
- Regular meals and snacks
- Exclude sugar & sugary foods
- Try to limit fatty foods

***Pre-existing DM***

- Review diabetic control before conception

# Breast Feeding

Closely monitor blood sugar level

- Increased energy requirement, an extra 40 g to 50g CHO per day
- Always eat before feeding
- Drink fluid 2 to 3 pints/day
- Extra snack at bedtime

# Older Adults with Diabetes

- Minimize hypoglycaemia
  - Regular meal times
  - Consistent CHO intake
  - Appropriate timing of insulin relatives to meals (if using insulin)
  - Extra snacks for extra activity
  - Treatment for hypoglycaemia available at all times
- Practical cooking tips
  - Shopping, food selection, ingredient substitution, portion control, labour-saving cooking techniques

# Monitoring

- Use of food record
- Record of “feeling” or “emotion”
- Tie in with SMBG
- Psychological Health

- Physical activity simply means movement of the body that uses energy.
- Walking, gardening, climbing the stairs, playing soccer, or dancing the night away are all good examples of being active.

# Exercise

*Beneficial effect of exercise*

- Increase insulin sensitivity
- Increase utilization of glucose (into muscle)

*Points to note for DM*

- Extra CHO is required
- Monitor blood sugar

# MEAL PLANNING

- Assess usual intake
- 24 hour recall
- Diet history

# Energy

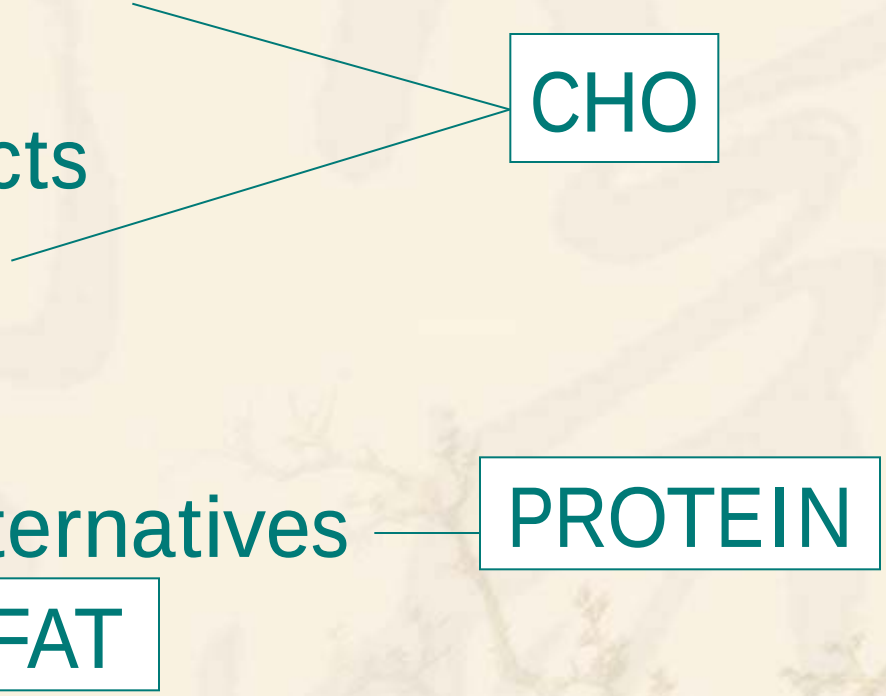
| 4 Cal | 4 Cal | 9 Cal |
| --- | --- | --- |
| Protein | CHO | Fat |

# Carbohydrate intake in diabetes management

- Monitoring CHO
  - CHO counting/exchanges
  - Experienced –based estimation
- Use of glycaemic index is a modest additional benefit

# Exchange System
## *Food Groups*

- Cereals/starch
- Milk/milk products
- Fruits
- Vegetables
- Meat & Meat Alternatives
- Fat & Oil



# Food Groups

| Food | Calories | CHO(g) | Protein(g) | Fat(g) |
|---|---|---|---|---|
| Starch | 44 | 10 | 1 | 1 |
| Fruit | 40 | 10 | 0 | 0 |
| Milk (skim) | 90 | 12 | 8 | 0 |
| Meat | 75 | 0 | 7 | 5 |
| Fat | 45 | 0 | 0 | 5 |

# Glycaemic Index

- It is a ranking of CHO on a scale from 0 to 100 according to the extent to which they raise blood sugar levels after eating.
- Determined by many physical & chemical characteristics, not just its sugar or fiber content.
- GI can be calculated as:

$$\frac{\text{Area under the blood glucose response curve for test food containing 50g CHO}}{\text{Area under the blood glucose response curve after glucose or white bread}} \times 100$$

# Glycaemic effect of CHO foods

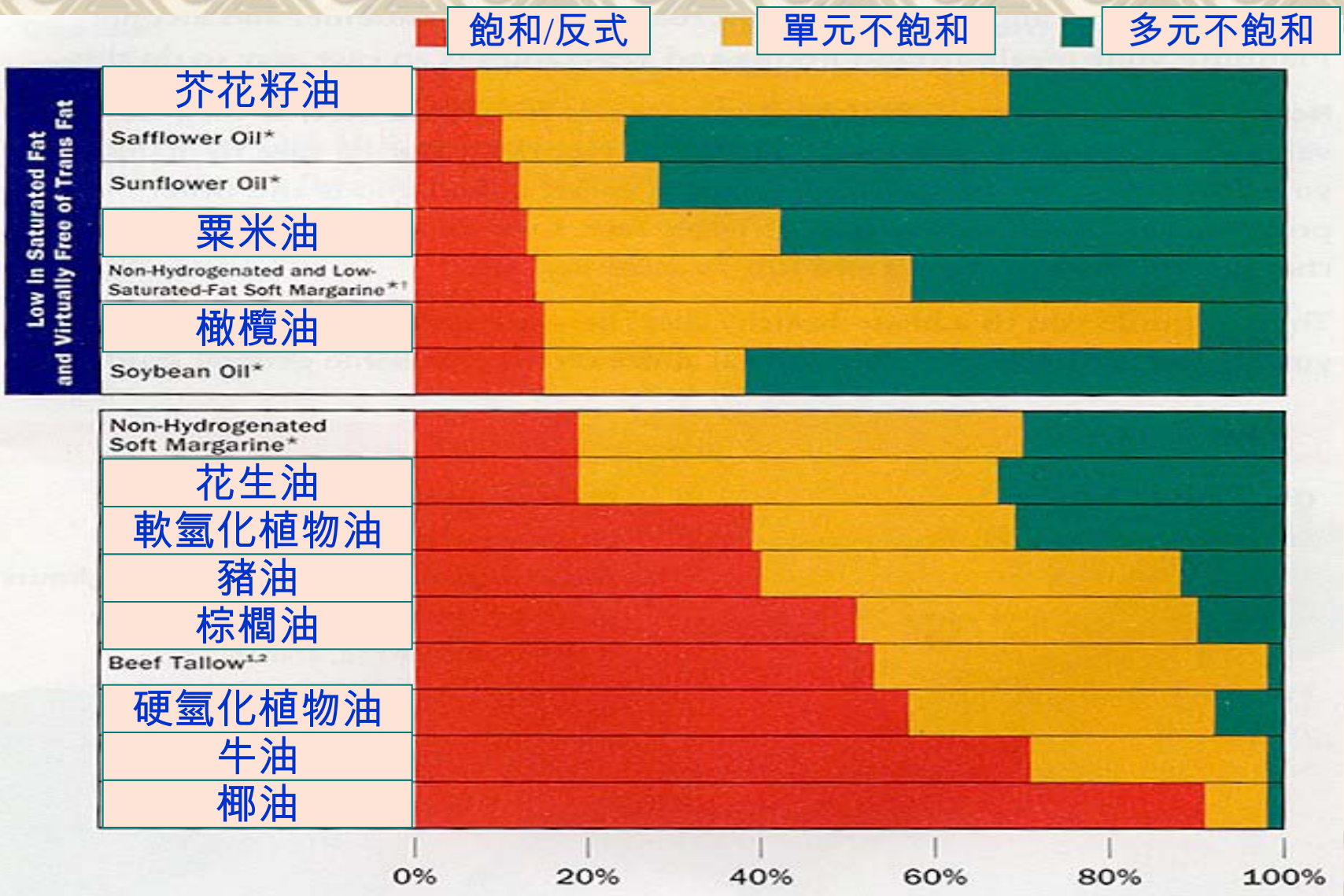
| | |
|---|---|
| Lower GI foods | Pulses, peas, beans & legumes<br>Oat-based cereals & oat products<br>Pasta<br>Raw fruit (not overripe)<br>Milk & plain yoghurt |
| Intermediate GI foods | New potatoes, granary bread, rice |
| Higher GI foods | Bread( white & wholemeal), corn or wheat-based breakfast cereals<br>Instant potato, old potatoes (especially if mashed)<br>honey. |

# Glycaemic Index

- Application
  - Practicality?
  - Tie in with CHO exchanges
  - Fit into the patient's goal

# Dietary Fat intake in DM Management

- Saturated Fat intake should be < 7% of total calories
- Intake of *trans* fat should be minimized




* Virtually free of trans fat (<1%).

† Figures for this category are based on the leading brand.

1 Used mostly as ingredients in prepared foods, these fats and oils are often hidden fats.

2 Cholesterol content (mg/Tbsp): Lard 12; Beef Tallow 14; Butter 33.
There is no cholesterol in any vegetable oil or vegetable fat.

# Meal Planning

- Based on the concept of healthy eating
  - Low fat, low sugar,low salt, high fibre
- Estimate energy intake
- Decide the quantity of CHOs
  - Cereal/starch, milk, fruits
- The no. of serving of meat
- Encourage vegetables
- Amount of oil in cooking

# Meal Planning
## Example

- Estimate energy intake e.g. **1500 Cal**
- Decide the quantity of CHOs
  - Cereal/Starch 16 15
  - Milk 1 1
  - Fruits 2 3

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- The no. of serving of meat 5 portions
- Encourage vegetables 3 servings → 1½ bowls
- Amount of oil in cooking 2 Tbs

# Nutrition Supplements

Principles :

1. Right amount
2. Right time
3. Read Labels

Look for total CHO

Serving Size

| Glucerna Approximate analysis | Per 8 fl oz | Per Liter |
|---|---|---|
| Energy, kcal | 237 | 1000 |
| Protein, g | 9.9 (16.7%) | 41.8 |
| Fat, g | 12.9 (49%) | 54.4 |
| Total Carbohydrate, g | 22.8 (34.3%) | 95.6 |
| Dietary Fiber, g | 3.4 | 14.1 |
| Water, g | 202 | 853 |
| Taurine, mg | 25 | 110 |
| L-Carnitine, mg | 34 | 145 |
| M-Inositol, mg | 200 | 850 |
| **VITAMINS** | | |
| Vitamin A (Palmitate), IU | 840 | 3520 |
| Vitamin A (Beta-Carotene), IU | 660 | 2780 |
| Vitamin D, IU | 67 | 285 |
| Vitamin E, IU | 7.5 | 32 |
| Vitamin $K_1$, mcg | 14 | 57 |
| Vitamin C, mg | 50 | 215 |
| Folic Acid, mcg | 100 | 425 |
| Thiamine Vitamin $B_1$, mg | 0.38 | 1.6 |
| Riboflavin Vitamin $B_2$, mg | 0.43 | 1.80 |
| Vitamin $B_6$, mg | 0.50 | 2.2 |
| Vitamin $B_{12}$, mcg | 1.5 | 6.4 |
| Niacin, mg | 5.0 | 22 |
| Pantothenic Acid, mg | 2.5 | 11 |
| Biotin, mcg | 75 | 320 |
| Choline, mg | 100 | 425 |
| **MINERALS** | | |
| Sodium, mg | 220 | 930 |
| Potassium, mg | 370 | 1570 |
| Chloride, mg | 340 | 1440 |
| Calcium, mg | 170 | 705 |
| Phosphorus, mg | 170 | 705 |
| Magnesium, mg | 67 | 285 |
| Iron, mg | 3.0 | 13 |
| Zinc, mg | 3.8 | 16 |
| Manganese, mg | 0.84 | 3.6 |
| Copper, mg | 0.34 | 1.5 |
| Iodine, mcg | 25 | 110 |
| Selenium, mcg | 12 | 50 |
| Chromium, mcg | 20 | 85 |
| Molybdenum, mcg | 25 | 110 |

# Menu Planning - application

- On a daily basis – include the 5 food groups
- On a weekly basis – variety

| | | | | | | |
|---|---|---|---|---|---|---|
| Pork | Fish | Egg | Bean | Fish | Beans | Chicken |

- Adjust the portions
- Choose the convenient, seasonal foods items

# Developing New Recipes

Start from the smallest yield possible.

Factors for consideration:

- Is it suitable for the patients?
- Are ingredients readily available?
- Is it within budgetary allowance?
- Are personnel skills adequate for preparation?
- Is preparation time available?
- Are equipment available for preparation?

# Recipe Costing

1. Add the cost of each ingredient in the recipe
2. Total all ingredient costs
3. Divide by the number of servings or portions to find out portion cost

# Desserts for DM

- Ingredients – sugar (white, brown, rock/slab), honey and syrup, sugar substitutes

- Other ingredients
  - Fruits e.g. banana, mango, papaya, oranges, melons
  - Starch - flour, glutinous rice flour, rice flour
  - Fats – butter, oil
  - Nuts

# Current Dietary Trend

- n-3 Fatty acid
- Organic foods
- Low Carbon diet
- Prebiotics and probiotics

- Omega 3 Fatty Acids
  - ALA
  - DHA
  - EPA

# Ω - 3 脂肪酸

## Possible cardio protective effects

| 魚 | **Ω - 3 FAs g/ 100g** (Harris & O'keefe) |
|---|---|
| 鮫魚 | 1.8 |
| 鱒魚 | 1.6 |
| 沙甸 | 1.4 |
| 吞拿 | 1.3 |
| 三文 | 1.1 |
| 蠔 | 0.4* |
| 蝦 | 0.2* |

* Source – The Fish foundation, UK

建議每週 5 to 10 克
(大概 3 to 4 份)

Vegetable source: flaxeed

# Organic foods: Are they safer? More nutritious?

| Conventional farmers | Organic farmers |
| --- | --- |
| Apply chemical fertilizers to promote plant growth. | Apply natural fertilizers, such as manure or compost, to feed soil and plants. |
| Spray insecticides to reduce pests and disease. | Use beneficial insects and birds, mating disruption or traps to reduce pests and disease. |
| Use chemical herbicides to manage weeds. | Rotate crops, till, hand weed or mulch to manage weeds. |
| Give animals antibiotics, growth hormones and medications to prevent disease and spur growth. | Give animals organic feed and allow them access to the outdoors. Use preventive measures — such as rotational grazing, a balanced diet and clean housing — to help minimize disease. |

# 精明選購

合時蔬果

營養標籤

切勿混淆天然/有機

清洗蔬果

生果去皮、蔬菜洗淨

# High carbon and low carbon food choices

- Certain foods require more fossil fuel inputs than others,
- making it possible to go on a low carbon diet and reduce one's carbon footprint(碳足跡)by choosing foods that need less fossil fuel and therefore emit less carbon dioxide and other greenhouse gases
- An organic vegan diet may reduce greenhouse gas emissions by 1.5 tons per year
- Choosing exclusively plant based (vegan) foods for one meal out of every five (20%)

# 碳足跡可以用直接產生與間接產生：

直接：以燃燒石化燃料為大宗，如汽車用油、家用瓦斯、電力消耗等，是指能源性的消耗，會直接產生二氧化碳排放的項目。

間接：以產品原料消耗為主，如開飲機(water dispensers)、葷食、免洗餐具等，是指為了生產產品或處理廢棄產品，因此而間接產生出二氧化碳的過程。

http://www.epb.tpc.gov.tw/_file/1150/SG/31451/D40000001150000001_1.html

# 識飲識食

- 原則
  - 三低(油、鹽、糖)
  - 一高(纖維素)
  - 加多一低 → 低碳
- 實踐
  - 均衡選擇
  - 多菜少肉
  - 不時不食（盡量選擇合時蔬果），多元化

# Prebiotics & Probiotics

- Prebiotics are non-digestible food ingredients that selectively feed probiotic bacteria
- Probiotics are “healthy” live bacteria e.g. bifidobacteria and lactobacilli that provide health benefits when ingested in the right amounts

# What benefits do prebiotics provide?

- Allow beneficial bacteria to grow in place of harmful bacteria in the intestine
- Strengthen body's natural defenses
- Optimize bowel function and regularity
- Maintain a healthy digestive system
- Increase mineral absorption (such as calcium, iron, and magnesium)
- May lower cholesterol

# Natural sources of prebiotics

- Asparagus
- Banana
- Chicory root
- Garlic
- Jerusalem artichokes
- Leeks
- Onion
- Wheat bran

# Home made yoghurt

Ingredients :

Skimmed milk, skimmed milk powder, culture

Equipment

Measuring cup,yoghurt cups, sieve, thermo pot

Method

- Warm milk, add in SM powder
- Add in culture, stir, sieve and pour into cups
- Warm water in the pot, put a shelf inside
- Put the cups on the shelf
- Cover the pot and leave for 8 hours or until set