

Vegetarianism and Utilization of Reusable Food Containers Reduces Carbon Emissions

Buddhist Tzu-Chi Dialysis Centre (Penang Branch)

GGHH Agenda Goals

- Food
- Waste

Organization Goal

- Reduction of carbon footprint through the promotion of vegetarianism, and utilization of reusable food containers.

Progress Achieved

- “ONLY VEGETARIAN” food policy was implemented since the opening of the center on 3rd August 1997.
- The use of reusable food containers and tumblers for food and drinks in Tzu Chi Dialysis Center were also initiated on the same date.
- Both policies were implemented and was accepted by all employees and patients in due respect to Master Cheng Yen, Founder of Tzu Chi Foundation who encourages them to respect and cherish other living creatures. Patients are only served with bread and beverages during dialysis treatment, and are encouraged to have their meals at home.
- Patients who observe vegetarianism show significant better control of phosphate compare to before conversion to vegetarian diet. To promote vegetarianism, all employees have free vegetarian lunches packed in reusable lunchboxes every Tuesday, Wednesday and Thursday since the day the dialysis center opened.
- The Buddhist Tzu Chi Dialysis Center institutionalized a policy requiring the employees to bring only vegetarian food in reusable containers to work in days where free vegetarian lunches are not served. Since the implementation of the policy the compliance of the employees is at 100%.
- The number of plastic wastes in the hospital was prevented due to employing policy on utilization of reusable lunchboxes since the dialysis center.
- The number of individual employees who decided to become vegetarian has increased from 28 to 51 employees in just a span of a year from January 2015 to September 2016

The reduction in carbon emission computation through vegetarianism and utilization of reusable containers and utensils are shown in the tables below:

Reusable Containers and Utensils

On average, food packaging for meals prepared or brought by employees, patients and volunteers is at least 200 plastic bags a day. This is the amount of plastic we save a day because food packaging used here are reusable containers.

The carbon emission of plastic is about 6 kg CO₂ per Kg of plastic. A normal plastic bag used for food packaging is about 5 g - 20 g depending on size and thickness. For the computation we used 10g being the average of 5g and 20g.

References: Environmental Working Group, US 2011

Table 1.0 Carbon Emission Reduction through Reduction of Plastic Bags

Duration	Plastic bags saved	Average plastic weight (10 g)	Reduction of Carbon dioxide emission (1Kg of plastic : 6 Kg of CO ₂)
Computation Process	(days * average plastic container consumption)	(average number of plastic containers / Average plastic weight)	(total plastic weight * CO ₂ Emission of Plastics)
1 Day	200 bags	2 Kg	12 Kg CO ₂
25 Days	5,000 bags	50 Kg	300Kg CO ₂
290 Days	58,000 bags	580 Kg	3,480 Kg CO ₂



Food packed in reusable food containers for the patients and employees

Vegetarianism Practiced

On the average a Malaysian adult chicken meat consumption is 40.85kg per year. Each day a person consumes 0.112kg of chicken which is about 0.037kg every meal (Chicken is chosen due to cultural acceptance by all races and religions in Malaysia).

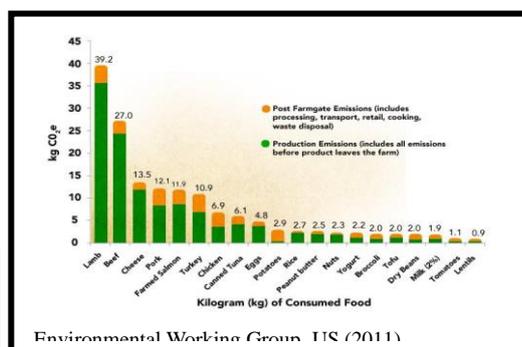
Every 100 gram of chicken is equal to 18.4 g of protein. On the other hand, 100 gram of tofu is equivalent to 10.9 g of protein.

The body requires a serving of protein each day which is around 7g. To meet the minimum protein requirement of 7g, an individual should take in 37g of chicken or 64 g of tofu. The table below shows the carbon emission generated for every 1kg production of chicken and tofu.

References: Nutrient Composition of Malaysian Foods 1997; Malaysian Food Composition Tables

Table 2.0 Generated Kg of CO2 for every serving of 7g of protein

	Kg of CO2 generated per Kg	Kg of CO2 generated as per 7g protein
Chicken	6.9	0.255
Tofu	2.0	0.128



Sample Computation:

Givens:

1. Conversion Equivalent of per Kg of CO₂ for every per Kg of Meat.

Adult Malaysian Average Chicken Consumption			
Adult Meat Consumption	Taiwanese Average		Kg of CO ₂ Generated per Kg of Chicken
40.85 Kg yearly			281.865 Kg CO ₂
0.112 Kg per day			0.7728 Kg CO ₂
0.037 Kg per meal			0.2553 Kg CO ₂

2. Equivalent Kg of tofu for every Kg of Meat per serving of protein (7g).

➤ Ratio of soybean to chicken in terms of protein content

Variable Computed	Grams of Tofu needed to acquire 7g of Protein	Applied Mathematical Operation (Division)	Grams of Chicken needed to acquire 7g of Protein	Tofu - Meat Ratio
Ratio of Soybean to Meat	64	÷	37	= 1.7297

➤ Kg equivalent of tofu per Kg of meat

Variable Computed	Kg of Meat	Applied Mathematical Operation (Multiplication)	Tofu - Meat Ratio	Kg equivalent of Tofu to 1 Kg of Chicken
Kg equivalent of Soybean for every 1Kg of Meat to have same amount of protein	1	*	1.7297	= 1.7297

3. Generated Kg of CO₂ for every serving of tofu based on 7g of protein

Variable Computed	Kg of CO₂ produced per 1Kg of Tofu	Applied Mathematical Operation (Multiplication)	Kg equivalent of Tofu to 1 Kg of Chicken	Generated Kg CO₂ of Tofu to have same amount of protein as with 1Kg of Chicken
Generated Kg CO ₂ of soybean to have same amount of protein as with 1 Kg of Meat	2	*	1.7297	= 3.4594

4. Carbon Emission Impact of 1 Kg of chicken in contrast to equivalent Kg of tofu

Type of Meat	CO ₂ generated per 1Kg of Chicken	Applied Mathematical Operation (Subtraction)	Generated KgCO ₂ of Soybean equivalent to 1 Kg of Chicken	Carbon Emission Impact
Chicken	6.9	-	3.4594	= 3.4406

5. Carbon Emission Reduction of Tofu Substitute for 200 persons per year.

Adult Taiwanese Average Meat Consumption	Applied Mathematical Operation (Multiplication)	Carbon Emission Reduction from Tofu as Substitute	Net Carbon Emission Reduction per person	Net Carbon Emission Reduction per 200 persons
40.85 Kg yearly	*	3.4406	140.5485	28,1097
0.112 Kg per day	*	3.4406	0.3853	77.06
0.037 Kg per meal	*	3.4406	0.1272	25.44

The Issue

- The Buddhist Tzu Chi Dialysis Center continues to grow and develop. At present, we have a total of 126 Hemodialysis patients, 32 Nursing staff, 55 Administration and supporting staff, and 5 Volunteers in this building.
- Environmental scientists have warned on the long-term effects of synthetic chemicals used in food packaging could be damaging our health. In a paper published by the Journal of Epidemiology and Community Health, the authors said small amounts of chemicals used in these materials can diffuse into food, and this can be accelerated by increased temperatures, the type of material used and the length of time foods were stored.
- Vegetarianism not only indirectly reduces carbon dioxide emission but also have the benefits of



- Lower body weight
- Better cholesterol levels
- Live longer
- Lower risk of developing cancer
- Reduces Risk of Cardiovascular Disease

Sustainability Strategy Implemented

Buddhist Tzu-Chi Dialysis Center not only provides holistic and humanistic approach to patient care, by encouraging vegetarian diet we are also protecting the environment , reduce water pollution and deforestation and also reduce animal cruelty, suffering and deaths of countless animals.

In carrying out this endeavor, we work closely with our stakeholders, our patients and employees. Initially, applicants are informed of the policies during the interview. Once hired, at their first day of work, an orientation is again conducted. Patients on the other hand are informed of the policies; they are explained on the rationale behind the policies. Annually, on family day and renewal of agreement in conducting dialysis they are once again reminded of these policies.



All new patients and volunteers are informed and advised regarding the vegetarian food policy, and the use of reusable food containers. They are also encouraged to do recycling not only due to environmental reasons but also to raise funds for dialysis treatment (a portion of charity fund in aid of the dialysis treatment comes from recycling products).

Volunteers conduct talks and activities to promote environmental protection and vegetarian food demonstration regularly at the center.

As supplement to the dissemination of information, lunch for patients and employees are provided on specific days of the week. These lunches are vegetarian and packed in reusable containers. They are also given new sets of food container, water bottle and chopsticks when hired or admitted to the dialysis center

Implementation Process

For Tzu Chi as an organization, vegetarianism comes naturally and a policy we follow. Tzu Chi Master, Cheng Yen, encourages her followers to respect and cherish fellow
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Guests also have to abide by the Vegetarian policy and the

living creatures, no matter the size or the species. This also means to abstain from harming other creatures and indulging in meat products.

Through this effort, we are not only able to conserve all forms of life; we are also able to contribute to reducing pollution and improving our individual health by eating responsibly and ethically. We do not face any issues of rejection or anyone against this policy, as we all respect and understand its implementation.

Tracking Progress

In Tzu Chi Dialysis Center, we all encourage the usage of reusable food container and would inform whoever that do not do so and it has become our culture and practice.

We do not track or force but rather educate and it has been part of our culture and practice). We do not monitor individuals who embraced vegetarianism as we believe it has to come from the heart and willingly. However, we do have more employees becoming Tzu Chi Commissioners who are required to be vegetarians.

In terms of the utilization of the reusable utensils, it is observed that patients and employees are compliant. In instances where the policy is not observed, both are immediately counseled.

Challenges and Lessons Learned

Through perseverance, continuous education and support, we managed to reduce the usage of food packaging by using the reusable food container. Most employees are still not fully observing vegetarianism and we continue to encourage them to carry on eating vegetarian meals even at home. At least five to six meals a week, vegetarian meals are served to them enabling them to take vegetarian meal while at work.

Next Steps

There are still rooms for improvement and the hospital is making efforts to encourage more employees and patients to observe vegetarianism. Moreover, provide a more stringent campaign of utilizing reusable containers and recycling to safeguard the Mother Earth. The adamant monitoring of indicators such as compliance with the policies will also be observed.

Demographic Information

Buddhist Tzu Chi Dialysis Center was the first dialysis center to provide free dialysis treatment, EPO injection, Blood tests and regular specialist checkup for all patients irrespective of race, religion or creed.

Presently we have 3 Tzu-Chi Dialysis centers in Malaysia, Penang (PGDC), Butterworth (BWDC) and in Alor Star (KDC).

As on 15th of August 2016,

- PGDC has 36 Hemodialysis machines, a total of 126 patients and 32 nursing staff
- BWDC has 33 Hemodialysis machines, a total of 94 patients and 21 nursing staff
- KDC has 22 Hemodialysis machines, a total 69 patients and 21 nursing staff

Buddhist Tzu Chi Dialysis Centre also provides free basic screening under the CKD awareness and prevention program.

Links

<http://tzuchi.org.my>

Quotes:

Saving Lives, Safeguarding Health and Upholding the Spirit of Love and Comprehensive Patient Care with Professionalism and Humanitarianism – Ms. Teoh Bee Ling

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September, 2016