

# Type 2 Diabetes Reversal: Complete Plan

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# Reversing Type 2 Diabetes: Six Steps to Natural Cure

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## Why Type 2 Diabetes Has Become a Lifelong Disease

Medical Profession has labeled Type 2 diabetes a progressive lifelong illness with no hope for a reversal or cure. The treatments offered in allopathic medicine have not focused on the cause of disease, which is unnatural foods and an unbalanced lifestyle. Instead, the focus mostly has been on lowering the blood sugar (glucose) levels via medications. The list of antidiabetic pills the patient gets prescribed keeps growing, with each succeeding year finally ending up with insulin and other injections. The unfortunate diabetic patients remain dependent on the expensive antidiabetic drugs for their entire living life. Reversing Type 2 diabetes is currently the new trend that is fast picking up the speed over the recent years.

The age-old wisdom in medicine states:

***“In medicine, we ought to know the cause of disease to be able to find its effective prevention and cure.”*** – Avicenna, Persian Physician (980-1037)

The cause of Type 2 diabetes is unhealthy commercial foods and an unbalanced lifestyle. These together cause a build-up of glucose in the body. The excessive glucose increases demand for the glucose utilization hormone insulin the body. Over time, high insulin levels create a dysfunction called insulin resistance. When insulin resistance sets in, body cells cannot use glucose properly. There is a build-up of excess glucose and fat in the entire body. The most effective way to prevent and reverse

Type 2 diabetes, therefore, is to modify the food and lifestyle, so the build-up of glucose and insulin does not occur.

Most allopathic drugs for Type 2 diabetes aim at lowering blood glucose levels by further increasing insulin levels. The insulin does not eliminate glucose from the body but redistributes it in the body, some of it as unhealthy fat. Over time, this excess glucose and fat cause cell damage that is responsible for complications such as retinopathy (eye damage), nephropathy (kidney damage), neuropathy (nerve damage), heart disease, limb damage, and the list goes on. The problem gets exaggerated in the Indian diabetic patients who are prescribed antidiabetic drugs in the doses meant for white Caucasian patients with a larger body mass. The relatively higher drug doses increase the risk of low blood glucose (hypoglycemia episodes) for which patients get routine prescriptions of frequent meals, sugary snacks, and beverages. Therefore, the treatment in itself worsens the disease by increasing the glucose burden on the body.

### **Sensible Strategies for Reversing Type 2 Diabetes**

Logically, reversal or cure is much more likely if treatment of Type 2 diabetes uses the following practical strategies:

1. Minimize the intake of excessive glucose in the diet via adopting low glycemic plant foods.
2. Adopt a balanced lifestyle to minimize blood glucose and enhance the utilization of stored glucose and fat.
3. Prescribe patient-specific antidiabetic drug dosages to minimize the risk of hypoglycemia. Every patient is unique in the way he/she responds to a drug. One fits all recipe does not work well, considering that Western doses of antidiabetic drugs would be too high for small mass Indian patients. Therefore, the hypoglycemia episode should serve as a vital signal to reduce the drug dose rather than a standing order for consuming sugary drinks and snacks.

Food and Lifestyle are personal choices, so Type 2 diabetes reversal requires that the patients take charge of the disease management. Taking charge requires that the patient has an excellent working knowledge about the Type 2 diabetes disease process.

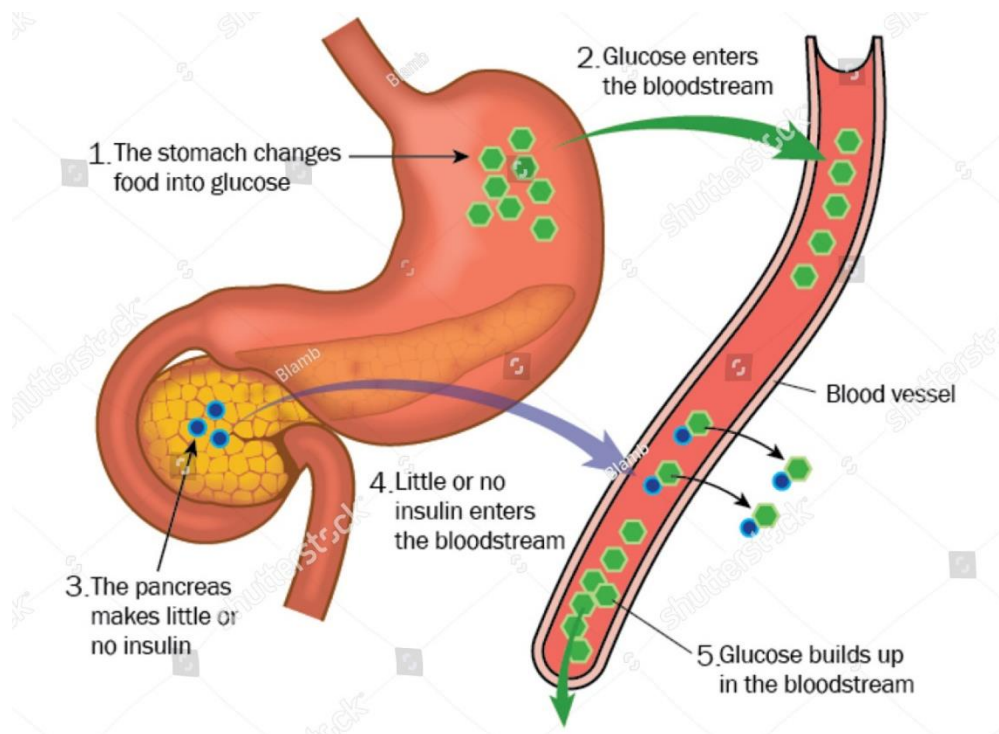
### **Understand Type 2 Diabetes to Manage and Reverse It**

(For a detailed explanation, review the Type 2 diabetes book and pamphlet posted on the website [www.foodlifestylebalance.com](http://www.foodlifestylebalance.com))

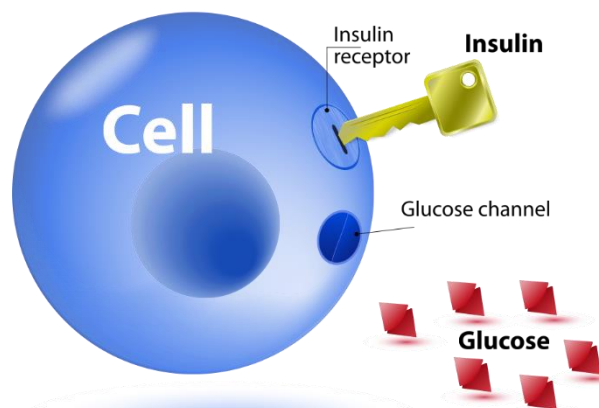
In most patients, Type 2 diabetes and Obesity occur together. Type 2 diabetic patients who are lean have smaller muscle mass and more fat. Insulin resistance from an excess of glucose and insulin in the body is the cause of excessive fat. To understand Type 2 diabetes, one has to get familiar with the following:

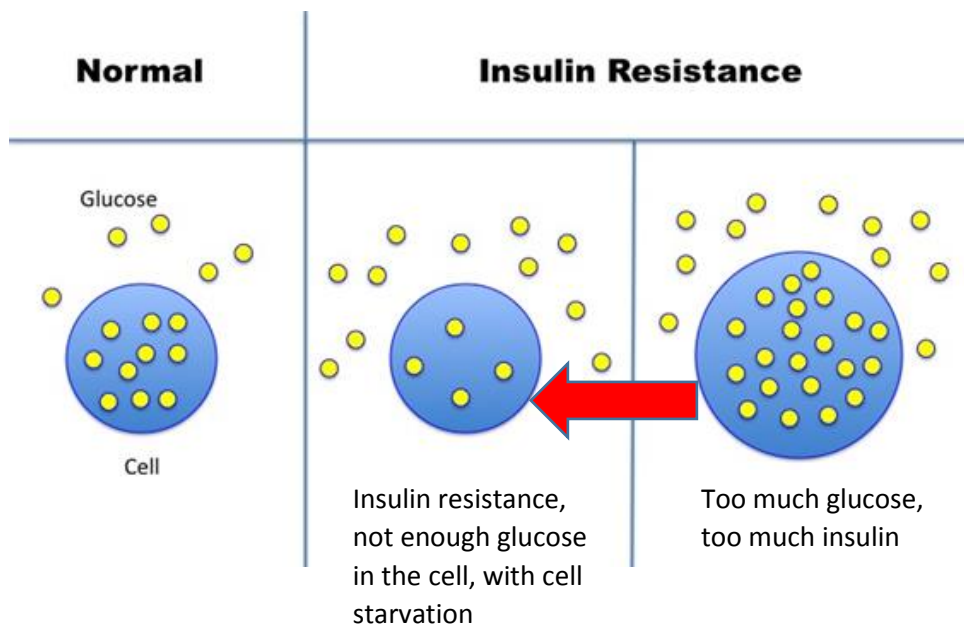
- **What is Glucose? What does it do in the body?**
- **What is Insulin? What does it do in the body?**
- **What is Insulin resistance?**

**What is Glucose?** There are trillions of cells in the body, each of which requires energy to survive. Glucose is a natural source of energy in the body. Insulin is an essential hormone that helps in transporting glucose into the cells. Insulin is produced by the specialized beta cells in the pancreas gland located in the abdomen behind the stomach. The glucose from the ingested food gets absorbed into the bloodstream. The rise in blood glucose releases insulin from the pancreas gland. The higher the blood glucose, the higher the amount of insulin gets released. High glycemic foods such as refined sugar foods and beverages lead to very high levels of glucose and insulin. Over time insulin-making capacity of the pancreas gets exhausted, and the patient requires insulin injections for disease control. High glycemic foods and drinks are the primary cause of Type 2 diabetes and Obesity in modern city dwellers.



**What is Insulin Hormone and Insulin Resistance?** Insulin is responsible for transporting glucose inside the cells. It works like a key that unlocks the door in the cell wall so the glucose can get in. When there is an excess of glucose and insulin, the cells get overfilled with glucose and fat. The cells create a protective shield to lock the glucose door so the excess glucose cannot enter. This protective mechanism is called Insulin resistance.



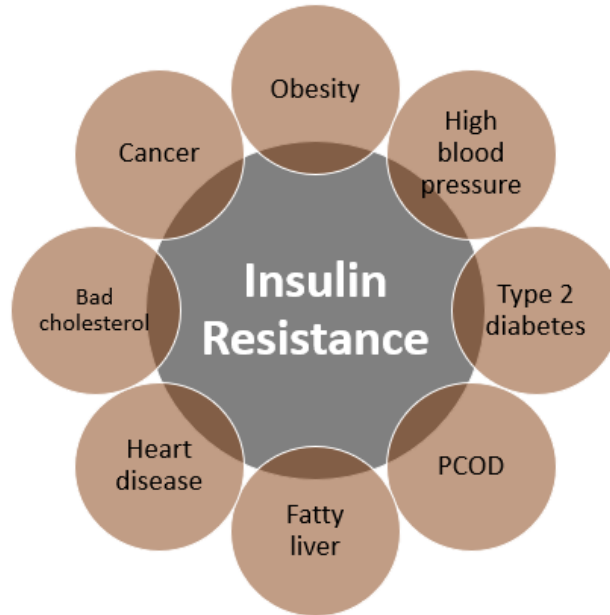


Insulin resistance protects body cells from glucose overdose. However, it has two undesirable effects that worsen the diabetes disease process in the body. These are:

- **Food cravings and overeating.** The cells locked out of glucose get into starvation mode. That produces the signals to eat more food to bring in more glucose from the digestive tract.
- **Higher insulin demand.** Starving cells demand more insulin from the pancreas gland to transport glucose to cells. Higher insulin levels mean more appetite and fat storage.



Insulin resistance, therefore, sets up a vicious cycle of abnormally high blood glucose and insulin levels. The mechanism of insulin resistance is at the root of many new food and lifestyle diseases such as Type 2 Diabetes, Obesity, High Blood Pressure, Heart Disease, Metabolic Syndrome, PCOS (polycystic ovarian syndrome of young females), and more.

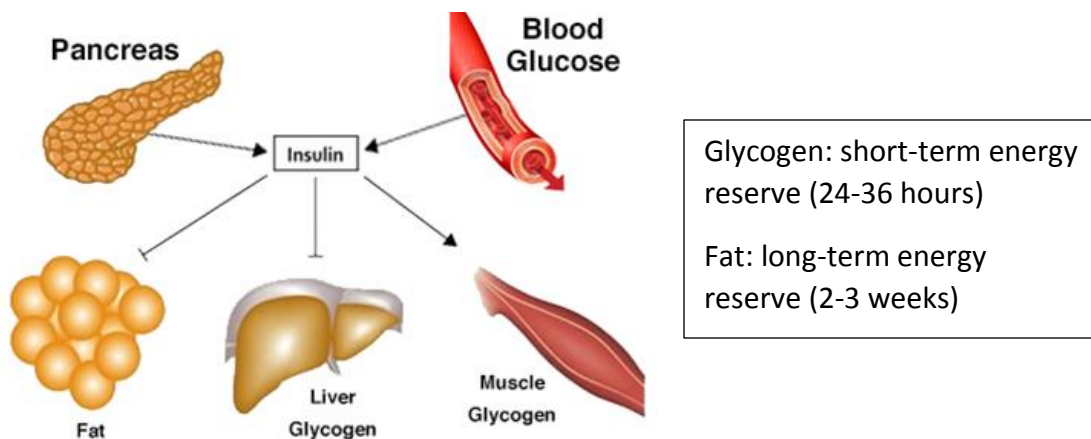


### Insulin Hormone and the Body Energy

Insulin is the primary hormone for producing energy in the body cells from glucose. Without insulin hormone, a human cannot survive for more than a few days. Two types of energy get produced from glucose with the help of insulin:

1. **Energy for immediate use by the cells.** Glucose from the ingested food provides glucose energy for the cells for a period of 1-3 hours based on the type of meal consumed.
2. **Reserve Energy.** The glucose in the blood left over after immediate energy usage gets converted into reserve energy to be used later when there is no glucose coming from the digestive tract. There are two types of reserve energy:

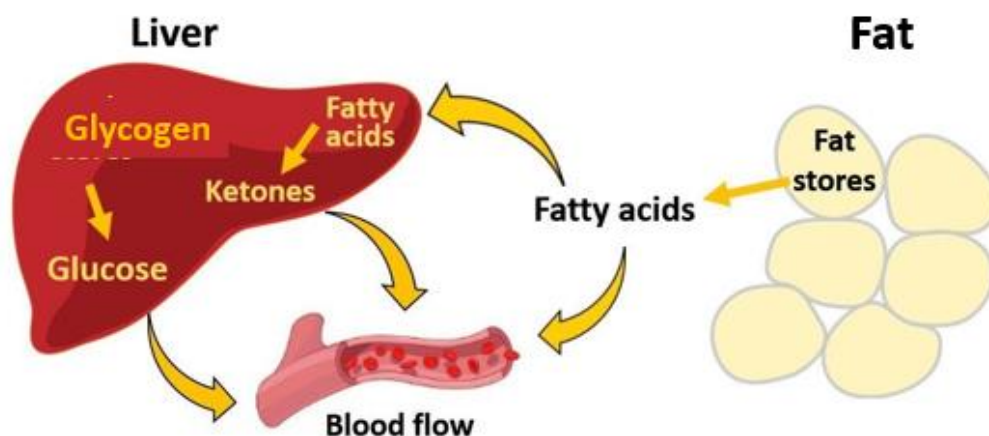
### Glucose and Fat energy reserves



- **Glycogen reserve energy.** It is a short-term energy reserve stored in the liver and muscles. Glycogen can be rapidly broken down into glucose for immediate supply, like a tap on the storage water tank. Glycogen reserves can provide energy for 18-36 hours, such as during overnight fasting period and between meals. Blood sugar is always high in the morning between 4-7 AM as the liver releases glucose to meet the demand for wake-up energy. The glucose for wake-up energy comes from glycogen stores in the liver. Muscle glycogen stores get used for physical exercise. The glycogen stores in the liver and muscles get depleted when someone fasts for 16-18 hours exercises.
- **Fat reserve energy.** After the glycogen reserves are filled up, extra glucose left over is converted to reserve energy fat. Fats get stored in the liver, abdominal cavity (abdominal obesity or potbelly), muscles, and under the skin. Body fat is a long-term energy reserve on which humans can survive for weeks of starvation. Unfortunately, the modern human has easy access to refined carbohydrates and sugary beverages which promote obesity by excessive fat synthesis. The capacity of the human body to store fat and get obese is unlimited. The only way to use up fat reserve energy is by fasting for greater than 16 hours.

### Type 2 Diabetes Is a Disease of Excess Fat Reserves in the Body

About 80% of Type 2 diabetic patients are obese, and 20% who are not (called lean diabetics) have excess fat, their muscles, and abdomen (prominent belly or potbelly). The only way to get rid of fat reserves in the body is by fasting for 16 hours and longer. Using up of fat for energy in the body is called the ketogenic cycle. It reverses obesity as well as Type 2 diabetes and many other insulin resistance diseases outlined above.



**Fat Reserve Energy: Ketogenic Path**  
(Fasting > 16 hours)

## **Necessary Facts to Know about Natural Type 2 Diabetes Reversal**

1. Unnatural high-glycemic foods and unbalanced lifestyles create high levels of glucose, insulin hormone, and unhealthy fat in the body.
2. Excess of glucose and insulin in the body leads to insulin resistance.
3. Insulin resistance is at the root of the long list of food and lifestyle diseases outlined above in the picture. Reversing insulin resistance will reverse Type 2 diabetes as well as all the other insulin resistance conditions described in the above image.
4. Insulin resistance causes food cravings and overeating, which further increases sugar and fat accumulation in the body.
5. The natural way to eliminate the disease process of insulin resistance is to reduce the demand for insulin by minimizing glucose load via appropriate food and lifestyle changes.
6. The most effective natural way to eliminate excess fat in the body is by Intermittent Fasting (IF) or Time-Restricted Eating (TRE). A fasting duration of longer than 16 hours reduces insulin levels. It also allows the body to use up the fat reserves for making energy.
7. IF or TRE also decreases the insulin levels in the body and reverse the phenomenon of insulin resistance.

## **Six Management Steps to Reverse Type 2 Diabetes**

As outlined above, the underlying abnormality in Type 2 diabetes is insulin resistance. There is no deficiency of insulin hormone until at a very advanced stage of Type 2 diabetes. In the advanced stage, the pancreas gland gets filled with fat, which chokes up insulin-producing beta cells. In contrast to Type 2 diabetes, Type 1 diabetes of young patients occurs from a total absence of insulin-producing capacity of the pancreas gland. These patients must receive insulin to survive.

The natural management of Type 2 diabetes focuses on lowering insulin demand to overcome insulin resistance via a six-step process:

1. Medical assessment to evaluate the severity of the disease and the social support system.
2. Establish a holistic meal plan.
3. Establish a Balanced Lifestyle Plan.
4. Adopt Time-Restricted Eating (TRE) or Intermittent Fasting (IF) schedule with close monitoring of antidiabetic drug dose and blood glucose levels
5. Plan on regular exposure to sunlight and normalize Vitamin D levels.
6. Stress management.



**Management Step #1: Medical assessment to evaluate the severity of the disease and the social support system.**

Prepare a baseline patient profile record based on medical assessment and laboratory testing. The baseline medical record is vital for periodic follow up on the adequacy of the reversal and management. The medical evaluation and testing must include the following:

- **Medical history.** Duration of condition, age of onset, antidiabetic drugs, and insulin or other injections, blood glucose control, frequency of blood glucose monitoring, complications—retinopathy, nephropathy, heart disease, dental problems, neuropathy, infections, and frequency of hypoglycemia episodes. (Diabetologist or personal physician consultation)
- **Lifestyle behaviors.** Prepare a minimum of a three-day realistic report on the number of meals, meal times, including late-night eating habits, the composition of meals concerning macro- and micronutrients, and snack consumption. Sleeping habits (time of wake up, alarm clock or no alarm clock), and activity exercise patterns.

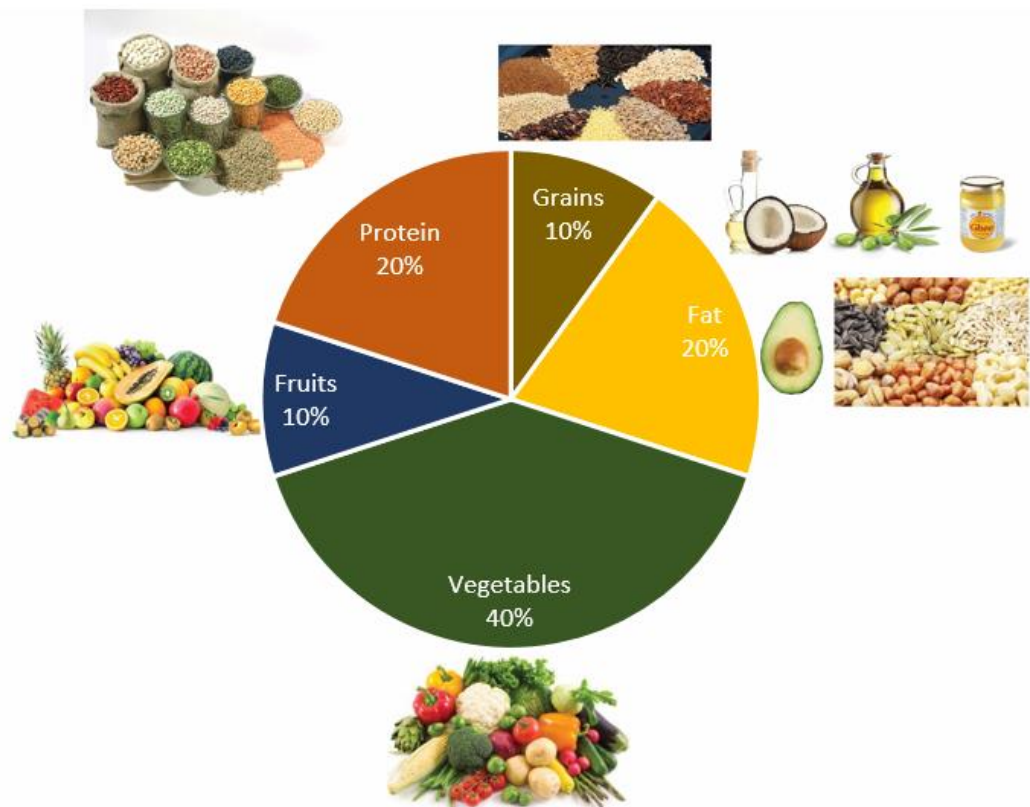
The Type2 diabetes Counselor compiles the patient chart, including the above information as well as the following:

1. Psychosocial status—assess the social support system, fear, anxiety, motivation, and ability to comply with the management plan.
2. Alcohol, smoking and other addictions
3. Physical evaluation: age, height, weight, and waist circumference
  - i. Heart rate, blood pressure (sitting and supine)
  - ii. Foot examination for neuropathy, circulation—the color of skin, capillary refill, and toenail.
4. Laboratory evaluation:
  - Fasting and 2-hour post-meal blood glucose level record of a week
  - Hemoglobin A1 C levels recent or within the past one month
  - C Peptide levels (patient’s capacity to make insulin)
  - Lipid Profile—check total cholesterol, HDL, and LDL cholesterol and triglyceride levels.
  - Spot urine albumin and creatinine ratio and serum creatinine and GFR calculation
  - Thyroid screen for the presence of hypothyroidism
  - Vitamin D and B12 levels
  - Blood chemistry to check for sodium and potassium levels
  - Specialty consultation reports for retinopathy, heart disease, nephropathy as indicated

## **Management Step #2: Establishing a Holistic Meal Plan**

(For details, refer to Holistic Meal and Balanced Lifestyle section on the website [www.foodlifestylebalance.com](http://www.foodlifestylebalance.com))

Design the holistic meal plan using the following guidelines:



1. Eliminate refined high-glycemic carbohydrates in all forms—white sugar and refined wheat flour products, including sweets, bread, baked goods, pre-prepared packaged, and fast foods, including boxed cereals, snacks, and breakfast options in packages.
2. Eliminate refined oils in all form—only consume natural cold compressed oils such as coconut, mustard, sesame oils (25-30 gm or 5-6 teaspoons) with 2-3 teaspoons of ghee for digestive health.
3. Eliminate all sugary beverages, including fruit juices (freshly squeezed as well as boxed).
4. Eliminate milk products except for small amounts of curd as thin lassi. Milk has insulin-like growth hormone and lactose sugar, both of which aggravate insulin resistance.
5. Eliminate acidic foods; the body is naturally alkaline. Acidic foods cause swelling and inflammation in the body. See the list of acidic versus alkaline foods on the next page.

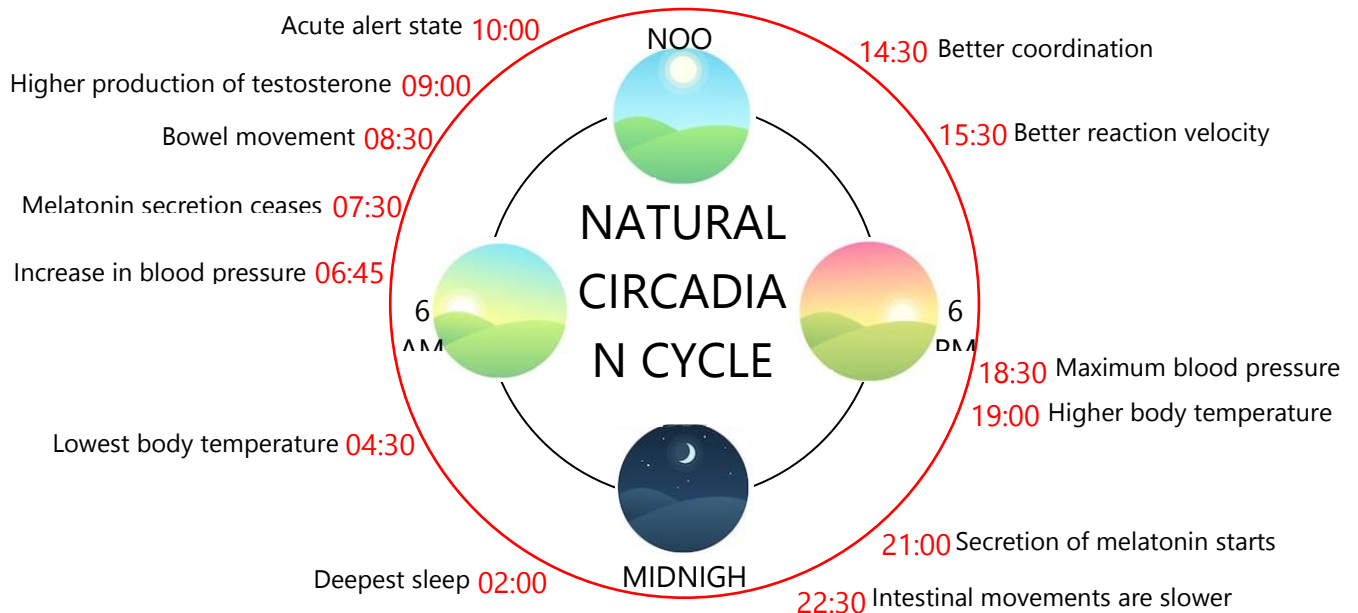
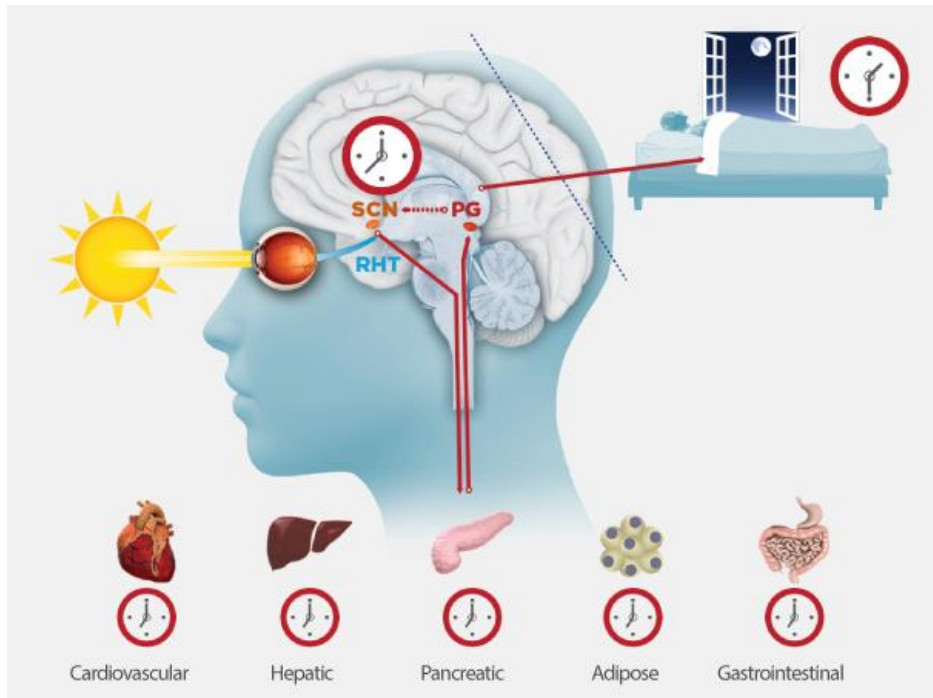
6. Minimize grain consumption. Eat whole coarsely ground grains, and eliminate grains ground into the form of refined flours.
7. Vitamin and natural herbal supplements—include fenugreek seeds, cinnamon, ginger, and turmeric in the diet to reduce inflammation and lower blood sugar.



**Management Step# 3: Establishing a Balanced Lifestyle Plan**

Nature has established a well-tuned and precisely balanced lifestyle plan for all living beings, including humans. The essential survival behaviors of Fasting/Feeding, Sleep/Wake, and Activity/Rest are under the control of the biological brain clock located in a specialized area of the brain. The brain clock works in harmony with light and dark signals of the sun cycle. Every organ system in the body

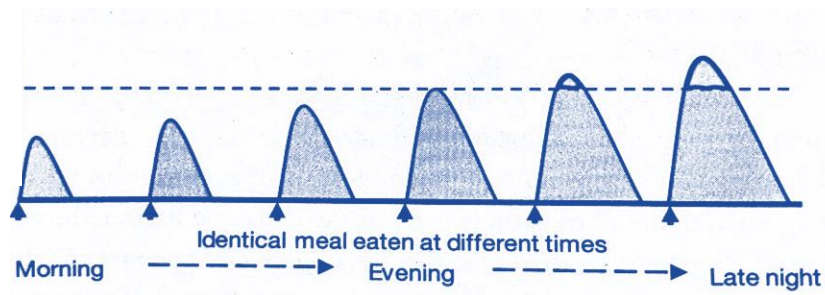
works in coordination with the brain clock system (see image below). The unique research into the biologic clock system and its 24-hour rhythms called circadian rhythm earned three medical physiologists (Drs. Hall, Rosbash, and Young) a Nobel prize in October 2017. The brain clock controls all body functions and behaviors such as digestion, metabolism, hormonal balance, sleep-wake, fasting-feeding, and activity cycles. When humans lose harmony with natural circadian rhythms, they fall victim to disease and dysfunction. The lifestyle of humans in the past 50-60 years has changed at a fast pace leading to a disconnection with the natural harmony.



### **Natural Circadian Cycle versus Balanced Lifestyle**

The balanced lifestyle is about keeping a disciplined approach to the following four essential behavior parameters controlled by circadian brain clock:

1. **When to eat.** Eating time influences the digestion of food, glucose utilization, and quality of sleep.
  - **Digestion of food.** Absorption, digestion, and metabolism of the food are best during daylight hours. The intestinal movements and digestion slow down after 10 PM ( see image natural circadian cycle). The food consumed after 8 PM will not move along the digestive tract at a healthy pace and not get digested properly. Late-night eating leads to indigestion, acid reflux, and bloating.
  - **Glucose utilization.** During the daytime hours, the demand for energy is high. The body is more sensitive to insulin during daylight hours. At night time energy needs are lower, so the body is more resistant to insulin. Even if one were to eat similar meals at different times of the day, the blood glucose levels would be lower in the morning hours and higher at night hours. Late-night eating after 8 PM invariably leads to high blood glucose levels, abnormal fat storage, obesity, and insulin resistance.



**Glucose Blood Levels vs. Meal Times**  
(from “*The Circadian Code*” by Satchin Panda, 2018)

- **Sleep quality.** Late-night eating after 8 PM is disruptive to deep rejuvenating sleep. When the food reaches the digestive tract, it increases blood flow, which raises the body’s core temperature (*Jathar Agni* in Ayurveda). For deep rejuvenating sleep, the body’s core temperature must come down. It takes the body 2-3 hours to cool down for deep sleep.
2. **How often to eat.** The frequency of meals influences glucose utilization. Before 1970, the traditional number of meals in a day was 2-3 amongst the populations around the world. Food and lifestyle diseases such as obesity and Type 2 diabetes were rare. Globally, eating frequency has multiplied amongst urban communities. Eating every 2-3 hours creates a vicious cycle of a consistent supply of glucose from the digestive tract with simultaneous insulin demand. A meal of any size, small or big, provides glucose supply for energy lasting 2-3 hours. After this time, the

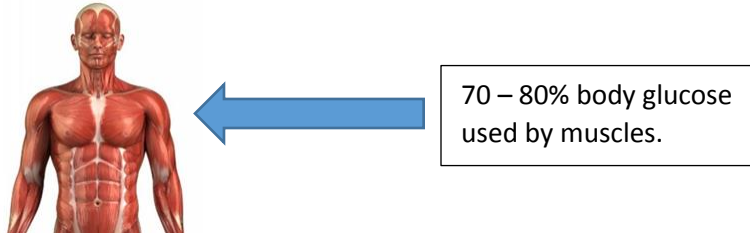
body must fall back on reserve energy of stored glycogen and fat. The habit of eating frequent meals prevents the body from using up the stored energy—glycogen and fat.

***The best way to use up stored glycogen energy is to exercise, and the best way to use stored fat energy is prolonged overnight fasting of greater than 16 hours each day and to eat no more than two meals a day.***

3. **When to wake up and sleep, Wake-Up** time in the morning resets the sleep time the following night. So the key to a healthy sleep routine is to get up early in the morning even if the bedtime changes. The early wake-up and going outdoors ensure exposure to the morning sun or bright morning light. Lack of exposure to sunlight or morning light reduces the synthesis of the sleep hormone melatonin in the brain. Additionally, exposure to bright artificial white light and blue light from cell phones and digital devices minimizes the release of stored melatonin. Both melatonin synthesis and release are critical to deep rejuvenating sleep. It is during the deep sleep that the body rests, repairs, and rejuvenates itself to keep itself disease-free. Lack of proper sleep elevates the level of the stress hormone cortisol, which contributes to insulin resistance and weight gain.
4. **Activity and Exercise.** Muscles use up 80% of glucose energy produced in the body. Physical inactivity and lack of exercise mean extra leftover glucose for making reserve energy fat. An exercise/activity routine to help reverse Type 2 diabetes and obesity is:
  - a) Exercise first thing in the morning on an empty stomach, so the body uses up stored glycogen and fat energy. Walking is an activity; it is not an exercise to lose weight and get rid of stored fat. To make walking into an exercise routine, use a high-low impact walking routine. An easy way to accomplish this at no risk of fall is to walk for 5 minutes, followed by stationary jogging for 1-2 minutes. In a 30-minute walking, there can be six cycles of high-low impact routine.
  - b) Start the day with breathing exercises or pranayama and yoga for 15-30 minutes. The easy to learn pranayama exercises are Om chanting and Kapalbhati. Yoga has become an international phenomenon because of its health benefits. The world has a designated international Yoga day, thanks to our Prime Minister, Narendra Modi.
  - c) Climbing stairs is an aerobic exercise. Start with one flight of stairs and advance to your capacity. Individuals with knee arthritis typically have a problem coming down the stairs, but no difficulty climbing the stairs. Climbing stairs will build muscle strength and help minimize joint strain and pain.
  - d) Bike riding, swimming when possible.
  - e) Stay active the entire day, logging 7-10,000 steps a day (this amounts to 2-3 miles of walk in a day).
  - f) Simple weight training using weights within the capacity to build arm muscles.

- g) Young adults and children must engage in vigorous exercise or sports at least 2-3 times a week.

Building muscles is the best way to utilize glucose energy and minimize insulin resistance as muscles can use up to 80% of glucose consumed.



***Management Step #4: Setting up Time-Restricted Eating (TRE) or Intermittent Fasting (IF) plan in conjunction with antidiabetic drug and blood glucose management.***

(For details on TRE plan, review this section on the website [www.foodlifestylebalance.com](http://www.foodlifestylebalance.com))

The TRE or IF programs simplify the science of keeping the body lean and disease-free. Instead of an elaborate routine of calorie counting or different kinds of diet plans, it shifts the focus to merely watching the clock for mealtimes.

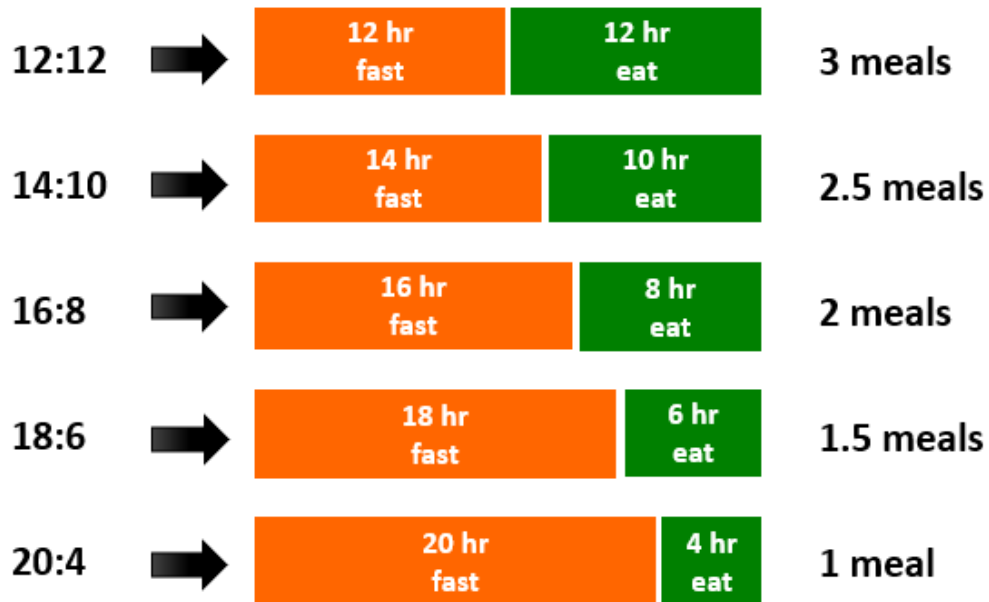


***“Watch the Clock and not the Calories.”***

The TRE/IF plans are gaining widespread popularity and receiving mainstream media attention for the management of Obesity and Type 2 diabetes. The campaigns on freedom from diabetes are using fasting methods as the primary treatment strategy. The significant advantage of TRE plans is that there is no restriction on the amount of food consumed at each mealtime. That prevents muscle loss and micronutrient deficiency. An essential requirement of TRE plans is strict adherence to holistic meals as per the guidelines outlined above. The TRE plan reverses Type 2 diabetes and obesity via three mechanisms:

1. TRE Plan steers the body towards the fat-burning ketogenic pathway. The body remains in a fat-burning ketogenic channel during overnight fasting hours. It reverts to the glycolytic pathway of glucose burning during the daytime feeding hours.
2. The plan normalizes blood glucose and insulin levels. The prolonged fasting duration of 16-18 hours or longer reduces the levels of glucose as well as insulin. Lower insulin levels also mean less fat synthesis and less appetite. High insulin levels are a trigger for fat storage.

- The plan reverses insulin resistance because fasting is associated with reduced insulin levels. A significant advantage of the TRE plan is the reversal and control of all the diseases related to insulin resistance.



\* Non-caloric beverages like water, green tea, and coffee are allowed during fast.

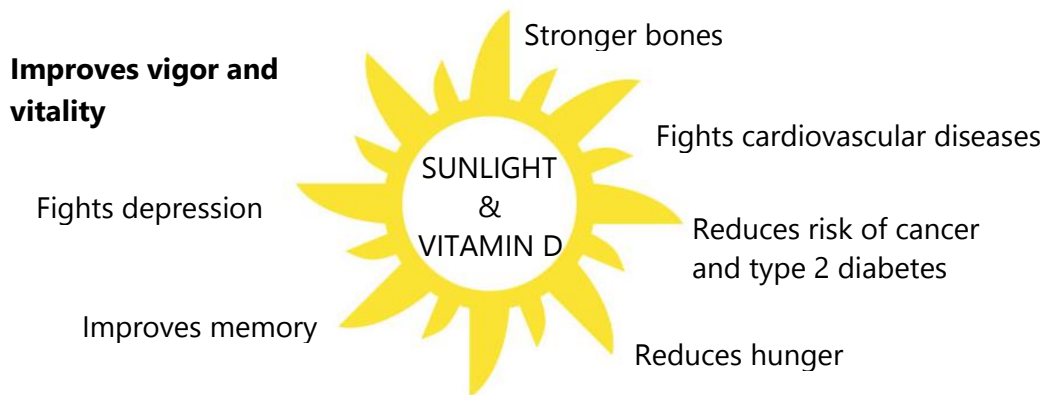
#### ***Intermittent Fasting Schedules***

The plan terminology uses the fasting interval between the evening meal the previous day the next meal the following day. The total number of meals in a day may range from one to three, based on the duration of the overnight fasting period.

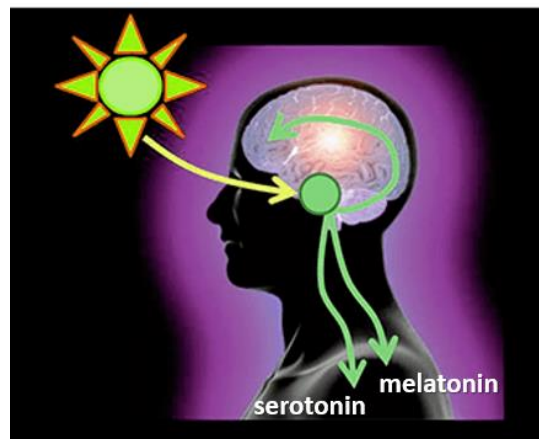
#### ***Management Step #5: Regular exposure to sunlight and normalization of vitamin D levels.***

The energy of the sun impacts every aspect of human health directly or indirectly through vitamin D synthesis. The vitamin D is unique amongst all the vitamins in that it supports many physiological reactions in the body, working more like a hormone. Sunlight and vitamin D have several beneficial effects on health:





1. **Hormonal balance.** The morning sunlight or bright light of the dawn enters via eyes to stimulate the hypothalamus area of the brain. The hypothalamus is the seat of managing several essential hormones such as growth hormone, insulin, thyroid hormone, cortisol, and the sleep hormone melatonin. Inadequate exposure to sunlight or bright daylight in the morning affects the secretion of these essential hormones vital to good health.
2. **Improvement in mood and sleep.** Sunlight or bright daylight exposure in the morning enhances the synthesis of the sleep hormone melatonin and mood-elevating chemical serotonin in the brain. People living in the geographic areas of the world with weak sunlight have a higher incidence of depression.



3. **Bioenergy of the sun boosts the immune system.**
4. **Ultraviolet rays of the sun enhance bone health via vitamin D synthesis in the skin.**
5. **Less hunger, less fat storage.** During daylight hours, the body remains active and insulin-sensitive, so more glucose is used up for energy and less leftover for making reserve energy fat.

At night hours, the body is inactive and insulin-resistant, so more glucose gets converted to fat. Late-night eating invariably leads to obesity even when one consumes holistic, healthy food.

**6. Normalizing Vitamin D levels improves insulin sensitivity.**



**There are all kinds of light for the sight!!  
For Health, there is only one light, and that is the SUNLIGHT.**

***Management Step #6: Stress management***

Emotional stress, anxiety, and fear increase the level of cortisol hormone and adrenalin in the body. Cortisol and adrenalin increase blood sugar. It is a well-known fact that the stress of surgery or significant illness leads to very high blood glucose levels in a diabetic patient. Elevated cortisol levels over the long term from chronic stress lead to a persistent increase in blood glucose levels. Chronically elevated cortisol also leads to insulin resistance. Stress management is vital to effective diabetes management.

The cost of care and physical limitations imposed by Type 2 diabetes remains a significant cause of stress. However, the hope of disease reversal, becoming drug-free, and reclaiming health in itself is uplifting, reassuring, and inspiring. Nonetheless, the patient does require significant emotional support from family and caretakers to stay stress-free, motivated, and committed to the reversal plan.

Once signs of a reversal such as weight loss, feeling energetic, blood glucose control, and reduction in drug dose start showing, the motivational forces and enthusiasm take over. However, the medical team and family have to stay engaged to provide support and motivation for the entire reversal program and beyond.

The reversal programs conducted in a group or community setting with patients and families working together are more effective as the patient, and families get the feeling that they are not alone in the game.

**Managing Antidiabetic Drugs with the Type 2 Diabetes Reversal Plan**

The Type 2 diabetes reversal plan rapidly reduces blood levels of glucose, so the management requires close follow-up of two parameters:

1. ***Glucose blood levels via frequent blood glucose measurements.*** Monitor fasting morning level, two-hour post-meal levels, and spot blood sugar to check if suspecting low blood sugar—the

feeling of weakness, anxiety, sweating, and rapid heart rate. Hypoglycemia episode is a crucial signal to reduce the dose of diabetic medication. The focus is to minimize diabetic drugs to control and prevent hypoglycemia. Sugar rescue for hypoglycemia pushes undesirable additional sugar into the body. Every effort should be made to reduce the hypoglycemic episodes by close monitoring of glucose levels and reducing diabetic drug dose.

2. **Antidiabetic drug dosages.** Progressive reduction of antidiabetic drug dosages requires close medical supervision. The first set of the drug to be gradually eliminated is insulin and other injectable medications. These are significant culprits in hypoglycemia episodes and weight gain. Most oral antidiabetic drugs, except for very few (metformin, a good example), increase the level of insulin in the body. Most antidiabetic medications raise insulin levels and require a steady dose reduction as the blood glucose levels start coming down.

A safe approach to the reversal plan is to proceed in a stepwise manner with close monitoring of blood glucose levels (per above guidelines):

- Start with Holistic Meal and Balanced lifestyle plan. Initiate an overnight fasting duration of 12 hours. Blood glucose levels will rapidly stabilize and start decreasing.
- Work with the physician to adjust and reduce insulin and oral medication dose progressively as the blood glucose levels start decreasing. The focus should be on eliminating Insulin and other injectable diabetic drugs first as these are culprits in fat storage and worsening the disease process. One can eradicate these within days to a few weeks, depending on the duration of Type 2 diabetes and the insulin-making capacity of the body, as shown by blood C peptide levels.
- If multiple meals are being consumed to minimize the risk of hypoglycemia, cut down the drug dose, and simultaneously reduce the number of meals to 3 meals a day with no snacking between meals. Any hypoglycemic episode is an important signal to reduce the drug dose. If on insulin preparations, decrease the drug dose by 2-4 units at a time based on blood glucose levels. It is safer to keep the blood glucose levels in a higher range, especially the fasting blood glucose levels in the morning. Fasting blood glucose levels up to 140mg/dl in the morning is a safer bargain over the hypoglycemia episodes during the night. Increasing the dose of insulin at night to aim for tight control of blood sugar in the morning does more harm than good.
- Once the blood hypoglycemia episodes are controlled, initiate the Intermittent Fasting plan progressing from the 12:12 hour routine.
- Advance the overnight fasting routine by one hour per week as tolerated.
- The number of meals will cut down to two meals a day when the overnight fasting hours reach the 16-hour mark.

- Advance up to an 18-hour fasting routine until hemoglobin A1C stabilizes at around 7 with no insulin and reduced doses of other antidiabetic drugs.
- Once hemoglobin A1C reaches seven or lower, metformin, or the antidiabetic drugs which do not increase insulin levels would be the drug to continue until complete reversal.
- Becoming drug-free does not mean discontinuing the reversal program. The reversal program of Holistic meal and Balanced lifestyle is a lifelong commitment. However, the overnight fasting duration can come down to 14 hours with two meals a day plan.

### **Type 2 Diabetes Reversal Program: Added Benefits**

There are several benefits of Type2 diabetes reversal plan:

1. The food cravings get eliminated when one arrives at a 16-hour fasting duration mark.
2. A steady reduction in body weight occurs with a loss of up to 7-10 kg over six months.
3. The physical energy and vitality improve significantly.
4. Blood pressure normalizes.
5. Kidney function, retinopathy, and neuropathy improve.
6. The blood cholesterol rapidly normalizes within three months.
7. Fatty liver will reverse with the weight loss and normalization of blood glucose levels.
8. The heart function will improve, and the risk of heart attacks diminish.
9. The sleep quality will improve significantly.
10. Body immunity will improve with reduced risk of infections.

### **How to Know that the Type 2 Diabetes Reversal Plan Is Working**

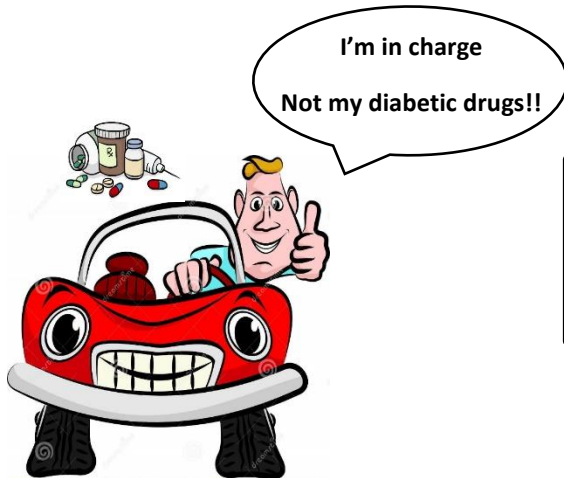
In addition to the above benefits, there are several parameters which indicate that the reversal program is proceeding as expected:

1. Blood glucose levels start decreasing within a few days of the initiation of the program.
2. As the dose of insulin and antidiabetic drugs decrease, food cravings get reduced.
3. Hypoglycemia episodes disappear as the drug doses come down. Every hypoglycemia episode is a signal to reduce diabetic drug dose further.
4. Weight loss occurs rapidly, up to 2-3 kg in the very first month of initiating the reversal program.
5. With appropriate exercise and weight training plan, the muscle mass improves; muscle fat diminishes with an improvement in muscle strength.
6. Pain in the joints and feeling of bloating in the body (swelling) diminishes with an overall sense of wellbeing and energy.
7. Thyroid hormone levels begin to normalize with a reduced requirement for thyroid hormone.
8. In males, testosterone levels normalize with improvement in libido. Fertility improves in both males and females.
9. Neuropathic pain diminishes.

10. Kidney function and retinopathy will stabilize and start getting better.

### **Attend to Infection and Illness without Any Delay**

Keep in mind that any infection or medical emergency is a significant stress for the body. It can throw the reversal program out of balance with a temporary increase in the need for antidiabetic drugs. However, once recovered, it is easy to go back to the reversal plan. The knowledge and experience keep you in the driver's seat, keeping the engine in the reverse gear and on its track.



Car photo from Dreamstime.com

*"Knowledge empowers us to conquer a problem."*

# Type 2 Diabetes Reversal: Daily Diet & Lifestyle Guideline

About 80% of Patients with Type2 diabetes are overweight or obese, so their diet plan must include a plan for weight loss also. About 20% of Type2 diabetes patients are lean or average weight, but these patients typically have abdominal fat (prominent belly), liver, and muscle fat. The abnormal deposition of the fat in the liver, abdomen, and the muscles are responsible for causing Type2 diabetes. Reversing Type 2 diabetes requires a change in the Food and Lifestyle in such a way that the abnormal fat gets eliminated from the body and the blood sugar control gets achieved naturally.

**Food and Lifestyle balance to reverse Type2 diabetes requires one to:**

- 1. Reduce high levels of blood glucose and insulin hormone in the body by adopting a holistic plant-based low glycemic natural foods--** Insulin is a fat-storage hormone, and low levels of insulin mean no fat storage. What matters the most is the quality of the food and not its quantity. The holistic plant-based diet is low in calories and rich in micronutrients—vitamins, minerals, and the cleansing antioxidants. The only source of disease-fighting antioxidants in the diet is colored fresh fruits and vegetables. Animal-based products such as meat and milk are zero in disease-fighting antioxidants and rich in disease-producing saturated fats. The western countries have taken note, and there are currently 600 million vegans (vegetarians who consume no meat or milk products). Unfortunately, while the West is turning vegan, the city dwellers in India are turning non-vegetarians and are big consumers of milk and its products, such as paneer and milk-based sweets.
- 2. Eliminate and minimize the following items from the diet:**
  - ***High glycemic carbohydrates in all forms*** -- White sugar products such as sweets and sugary drinks of all kinds, refined wheat flour products including baked goods such as bread, all sorts of biscuits, pre-prepared foods in packages, all boxed breakfast cereals including those which claim health benefits, junk foods, and fast foods.
  - ***Eliminate refined oils in all forms*** -- Only consume natural cold compressed seed oils such as Mustard, Sesame, and coconut oil. Be aware

that baked goods such as cakes, muffins, bread, and biscuits get made with refined palm oil, which prolongs the shelf life of all these products to many days. It is healthy to consume 1-2 teaspoonful of ghee daily in the diet for its healing effect on the digestive tract and its immune-boosting property. Note that most olive oil sold in India is refined vegetable oil mixed with a tiny fraction of olive oil. The pure sesame oil matches in its qualities to olive oil and is a far healthier option than the most olive oil sold in the Indian markets.

- ***Eliminate all sugary beverages, including fruit juices*** -- Removing fiber from the fruit for making the juice makes it a concentrated preparation of fructose sugar. That gets absorbed rapidly from the digestive tract. Drinking fruit juices increases the risk of fatty liver, which is a significant risk factor in causing Insulin resistance and Type2 diabetes.
- ***Eliminate milk and milk products such as paneer and all milk-based sweets*** -- The only milk product to be consumed is a small portion of curds (dahi) and thin lassi.
- ***Minimize refined milled grain flour from chapatis*** -- Eat only home ground coarse grain flours which retain fiber and endosperm of the grain. Several grain grinders for home use are available in the market at a cost as low as INR 15,000.
- ***Minimize total grain consumption as much as possible.***
- ***Do not overcook vegetables, especially in a pressure cooker*** -- Overcooking vegetables destroys their nutritional value. The healthiest way to eat vegetables is half the amount eaten raw as salads and smoothies and half as cooked (no pressure cooker).
- ***Eliminate or minimize acidic foods from the diet*** -- The body is naturally alkaline. Acidic foods cause swelling, bloating, and inflammation in the body. All vegetables and fruits are alkaline. The meats, milk products, fruit juices, sugar, chocolates, sweets, and refined grain products, tea, coffee, and alcohol are acidic. The acidic and alkaline foods should be consumed in a ratio of 1:4. That is alkaline food four times the amount of acidic food in meal preparation. For example, when making an omelet, use a whole egg with its entire yolk. Prepare the whole egg scrambled with four times its weight in vegetables. Use the same method of cooking when preparing

paneer curry- No paneer tikka but palak paneer or paneer with green peas or paneer with mixed vegetables.

### 3. Adopt a balanced lifestyle

A balanced lifestyle is about keeping a disciplined approach to the essential lifestyle behaviors such as Fasting/ Feeding, Wake/ Sleep, Activity & Exercise.

Reversing Type2 diabetes and achieving lean disease-free body requires paying attention to the following:

- ***What time to eat*** — Digestion and metabolism of the food are at best during daylight hours. The night time is for rest, repair, and rejuvenate of the body organs, including the digestive system. The body is active during the day, so it is more sensitive to insulin. During the day, insulin uses up glucose absorbed from the digestive tract for making energy. At night the body is inactive and insulin resistant. Therefore, the glucose absorbed from the digestive system gets converted to fat by insulin. The food consumed after 8 PM ( even very healthy food) ends up getting converted to fat because the body does not require glucose energy at night hours.
- ***How often to eat*** — The food absorbed from the digestive tract provides glucose supply for making energy for 2-3 hours. After this time, the body falls back on its stored reserve source of energy, which is glycogen and fat. Eating multiple meals a day provides a constant flow of glucose from the digestive tract and prevents the body from using up the stored fat. The best way to use up stored body fat is to exercise in the morning on an empty stomach after overnight fasting of several hours.

Fifty years ago, before 1970, most populations in the world ate 2-3 meals/day. These meals typically got consumed during 8-12 hours of the daylight hours. Obesity and its related diseases like Type2 diabetes, high blood pressure, and heart disease were rare. The current trend amongst city dwellers is multiple meals consumed during a period of 14-16 hours extending late into the night hours. As a result, Obesity, Type2 diabetes, and related diseases have become an epidemic amongst the city dwellers.



- ***What time to wake up*** - Morning wake up time regulates sleep hours, eating, and activity behaviors. In the late risers, all these behaviors get disrupted, resulting in obesity, Type2 diabetes, and related diseases.
- ***Activity and Exercise*** -- Muscles use up about 80% of glucose consumed in the food. Less muscle activity and no exercise means extra glucose leftover in the blood for making unwanted fat.

#### 4. **Adopt Time Restricted Eating (TRE) or Intermittent Fasting (IF) program**

The most effective plan to get rid of abnormal fat and control blood sugars in overweight and obese Type2 diabetics is the TRE plan. A fasting duration of 16-18 hours between the previous night meal and next morning or next day meal is ideal for using up the unwanted, stored fat. The practical way to build up an overnight fasting duration of 16 hours is to start at 12 hours fasting and build it up progressively over 4-5 weeks to 16 hours. The TRE plan of the overnight fasting duration of 16 hours calls for two meals per day- Brunch (combining breakfast and lunch as one single meal between 11 Am to 12 noon)) and early dinner before 8 PM the previous day.

A good plan for a lean diabetic, on the other hand, is 12-14 hours of overnight fasting (dinner by 8 PM and next morning meal between 8 -10 AM) with three meals per day comprising of Breakfast, lunch, and dinner.

(Note: For details check the section of Time-restricted eating for the lean and disease-free body on the website: [www.foodlifestylebalance.com](http://www.foodlifestylebalance.com)).

#### **Holistic Meal Plan for Type2 Diabetes Reversal**

***( Note: For cooking meals, use only cold compressed Mustard, Sesame and coconut oil 3-6 teaspoonfuls with 1-2 spoons of Ghee. The obese Type 2 diabetics should use lower amounts of oil and ghee)***

## **Meal Plans:**

- A. ***Lean or average weight Type2 diabetic patients*** -- The ideal meal plan for these patients is three meals/ day- Breakfast, lunch, and dinner with an overnight fasting duration of 12-14 hours. The dinner the previous night should be between 7-8 PM and the Breakfast next morning between 9-10 AM. It is preferable to eat a grain-free breakfast.
- B. ***Obese Type2 diabetic patients*** – The ideal meal plan for these patients is two meals/ day with a small low glycemic (nonsugary) snack in between two meals only if hungry). The two meals are Brunch (a combination of breakfast and lunch) and dinner. The fasting duration between dinner the previous evening and next morning meal is progressively increased by one hour each week until the fasting duration of 16-18 hours gets achieved. When the overnight fasting duration of 16 hours gets reached, the dinner is between 7-8 PM, and brunch the following morning is between 11 AM and 12 noon.

### ***Rules of Eating Holistic meals :***

- Cook the meals only with the natural oils (cold compressed sesame, Mustard, and coconut oil) 3-6 spoons with 1-2 spoons of ghee. The lower amounts of the oil and ghee for the overweight and obese Type2 diabetics.
- Eat half the vegetables raw as salads and smoothies
- Eat primarily plant-based low glycemic foods.
- Eliminate sweets, especially milk-based sweets.
- Eliminate animal meats.
- Minimize milk consumption-- Eliminate milk-based drinks, panner, and milk-based sweets.
- Eliminate sugary beverages including all fruit juices or vegetable juices which have no fiber — instead, consume smoothies that use the vegetables and fruits as a whole, retaining all the fiber. The presence of fiber in the food minimizes the absorption of sugar and fat from the digestive tract.

- Eliminate refined milled grain flours of all kinds--Eat home ground coarse grain flours. Review the recipe for wholesome chapatis in the recipe section to make nutritious low gluten and low glycemic chapatis.
- Minimize consumption of acidic foods-- The acidic foods list is milk products including paneer and sweets, chocolates and white sugar sweets, animal meats, tea, coffee, and alcohol. Natural plant foods such as fruits and vegetables are alkaline. A diabetic patient has to minimize fruit consumption to one cup a day because the fruit is rich in fructose sugar.

#### **A. Meal Plan For Lean or Average Weight Type 2 Diabetic**

##### ***Breakfast Meal options***

- Start the day with calorie-free drinks including Indian spice tea( see several recipes for calorie-free beverages in the recipe section at the end)
- Start the breakfast between 8-9 Am with the super green smoothie. Add one teaspoon of super herbal powder (the recipe for both included in the recipe section). The smoothie is very filling and minimizes the need for other breakfast items.

Select breakfast options from any of the following options to keep the grain content low. Can use your traditional options provided the grain content is minimal.

- Lentil or besan- chilla or green moong- dosa with sesame/ flaxseed or coconut chutney (see the recipe section for chutney recipes) or homemade pickles made with cold compressed mustard or sesame oil.
- Raghi Uttipam – add lots of vegetables, curry leaves, and fresh coriander to minimize grain content.
- Sambhar or rasam—Make with lots of seasonal vegetables as an accompaniment to dosa, uttipam, and chilla.

- Quinoa, oatmeal or millet Khichari with lots of seasonal vegetables ( see recipe section)

Eat Khichari with fresh pickles made with mustard, methi seeds, and mustard oil.

- Quinoa or cracked wheat Upma with lots of vegetables (see recipe section).

## **B. Overweight and obese Type2 diabetic**

### **Brunch (breakfast plus lunch meal) options**

- Start the day with calorie-free drink options including Indian spiced tea (See the recipe section)
- Supergreen smoothie with one teaspoon of super herbal powder at 11 AM to 12 Noon.
- Follow with the Salad made of fresh vegetables- Check the salad options in the recipe section. Use apple cider vinegar or lemon with 1-2 teaspoons of sesame oil with condiments of your choice for salad dressing. The healthy sesame oil will keep the stomach full for a longer time.
- Follow with any of the breakfast options outlined above with freshly prepared chutneys and pickles. Eat traditional breakfast options very low in grain content and high in vegetable content.

OR

Eat the usual lunch meal with options of dal and fresh vegetables. Eat more vegetables and dal compared to the chapters made from the grain or the rice.

- Eat different varieties of dals and legumes over a week. Preferably eat two vegetables, one of which must be a green vegetable.
- Eat one to two small wholesome chapatis made from the home ground multigrain wheat flour (see the recipe section for healthy chapatti option). Never eat chapatti and rice without ghee or sesame oil. The oil and ghee slow down the absorption of grain carbohydrates. The ghee also

minimizes food cravings and hunger by keeping the stomach full for a longer time.

- A small glass of thin lassi made alkaline with curry leaves, coriander leaves, ginger, and cumin seed powder or a small amount of curd as raita with different vegetables, vada (lentil dumplings)

## **Lunch and dinner meal options**

(Note: The lunch and dinner meal options are similar for lean and obese Type2 diabetes with the difference of less oil and ghee for overweight and obese diabetics.

- Always start the meal with Mixed salad (see the recipe section for some salads choices ).

The most healthy holistic salad comprises of a mixture of 3 seasonal vegetables( radishes, cucumber, tomatoes, turnips, green peas or green chana), half cup of a choice of three seasonal fruits, choice of three sprouts- methi, moong, matki, brown or yellow chana, whole masoor dal, three nuts of any kind and three seeds of any kind. Use super herbal powder one teaspoon with one teaspoon of sesame oil and lemon juice or apple cider vinegar as dressing (see the recipe for this Trimurti salad in the recipe section)

- Two cooked vegetables (one must be green ).
- Preparation of the lentil or legumes of different varieties each day. At night stay with alkaline moong dal of various types.
- Wholesome chapatti (see recipe section) – Eat one to two small sizes with sesame oil or ghee.
- Curd or thin lassi with curry leaves, coriander leaves, mint, ginger, and cumin seeds— The ideal time is after the lunch or brunch.
- If you have a craving for the sweet, eat it during lunchtime along with the meal. Avoid white sugar and use sweets made from jaggery as a sweetener. Good options are sesame –jaggery Laddos (rich in calcium and phosphate), coconut/ jaggery laddoo or vegetable halva. Use restraint, do

not overindulge and restrict to one serving 3-4 times per week. Stay active to use up the extra consumed calories from the sweet.

- Rice is a healing grain for the digestive tract, especially when consumed with a small amount of ghee along with lentils and legumes. The healthiest way to eat rice is to put 3-4 teaspoons of rice in a bowl of lentil or legumes soup dish. Consuming a small amount of rice with lentils/legumes and a spoon of ghee or sesame oil will not raise blood sugar significantly.

### **Diabetic Patients with nephropathy (kidney disease)**

Uncontrolled diabetic patients with high fasting blood sugar levels higher than 140mg/dl end up developing Nephropathy and Retinopathy (kidney and eye damage). Patients who require multiple drugs and insulin to control diabetes also are more likely to get serious complications. These patients need a tightly controlled food and lifestyle regimen to control blood sugar and minimize the number of medications, especially insulin. Insulin is a fat-storage hormone which, in higher doses, ends up increasing the complications of diabetes.

Patients with nephropathy require adjustment in diet regimen because damaged kidneys cannot excrete breakdown products of proteins and excessive water and some electrolytes such as potassium. To minimize protein consumption, the dietary guidelines in the presence of kidney damage are:

- Minimize meat and milk consumption
- Minimize Lentil and Legume consumption to half.
- Minimize grain consumption.
- No coconut water and coconut milk, and minimize coconut products.
- Minimize consumption of fruits rich in potassium such as banana and oranges.

## **High Blood Uric Acid and Type2 diabetes**

Fatty liver is a common occurrence in a diabetic patient. High uric acid in a diabetic patient is due to the fatty liver. A perfect approach to get rid of fatty liver and high uric acid is to reduce body weight via food and lifestyle change. Unfortunately, however, the methodology used by most doctors to treat high uric acid is to prescribe a low protein diet (no lentils and legumes) and minimize the consumption of green vegetables. This strategy is counterproductive because patients replace the protein with more grain and carbohydrates, making fatty liver worse. The protein to be prohibited with high uric acid is animal protein and not the vegetarian protein.

Type 2 diabetic who follows the above outlined dietary and lifestyle regimen for reversing Type2 diabetes, will naturally get rid of fatty liver and high uric acid within a matter of 3-6 months.

# Recipe Ideas for Type2 Diabetes

## Calorie-free drinks

### 1. Spiced Tea Mixture

#### Ingredients for 2-3 cups of tea:

- Two teaspoon Saunf
- One-Two pieces Cloves( Lavang)
- One-Two pieces Eliachi (cardamom)
- One-inch piece Cinnamon
- Three-Four pieces full Black pepper kernels ( optional)
- A pinch of dry ginger powder

Note: You can mix all ingredients in a large amount and store it in a jar.

#### Instructions:

- Boil two-three cups of water, while boiling add 2 teaspoons of spice tea mixture, immediately turn off the heat.
- Cover the pot with a lid and let brew for 3-4 minutes.
- Strain it and drink it fresh. Do not store the tea; it will get bitter over time.
- If you do not have diabetes, you may add brown Jaggery small amounts as a sweetener.
- If you like, you may add a twist of lemon juice

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### 2. Lemon Ginger water

#### Ingredients for 2-3 glasses:

- Juice from one lemon or two tablespoons of lemon juice (adjust to the sour taste of your choice)
- One teaspoonful of crushed ginger



**Note:** The crushed ginger can be made in a large amount and stored in the refrigerator in a glass container for 3-5 days.

**Instructions:**

- Mix lemon and crushed ginger with 2-3 glasses of water in a jug.
- Add condiments of your choice – cumin powder, rock salt (optional).
- If you are not overweight, then as a sweetener, you may add brown jaggery. Pure honey can be another option as a sweetener. However, pure honey is hard to get as the honeybee population in the world has shrunk to 30% because of pesticide sprays.

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### **3. Carrot Beet Root fermented drink**

**Ingredients for 5-6 small glasses**

- Two medium hard-boiled or raw beets
- Two medium Carrots
- Lemon Juice – squeezed from 1-2 lemons
- One teaspoon Mustard seeds
- Two-inch by a Two-inch piece of Ginger
- Half teaspoon Cumin seeds
- One small Green Chili
- Rock salt to taste

**Preparation:**

- Cut beets, carrots, ginger, and green chili in small pieces.
- Pound mustard and cumin seeds to a powder
- Put beets, carrots, ginger, green chili, mustard, and cumin seeds into a high powered blender.
- Add salt, lemon juice, and 5-6 glasses of water to blender.
- Blend all ingredients into a smooth mixture.
- Keep in a glass container for 1-2 days for fermentation at room temperature.

- Strain the mixture and store the clear liquid in a glass jar or container in the refrigerator(Stores up to a week)

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### 3. Clear Tomato Rasam

#### Ingredients for 0.5 liters Rasam (4-5 cups)

- One medium tomato cut into small pieces
- Half tsp turmeric
- Half tsp mustard seeds
- Half tsp cumin seeds
- Half Tsp black pepper powder( Kali Mirch)
- Three tsp ghee
- Few curry leaves
- Green chilies to taste cut up in pieces.
- Lemon Juice – squeezed from 1-2 lemons

#### Preparation:

- Heat the ghee in a skillet.
- Put mustard seeds.
- . Once these start crackling, add cumin seeds followed by chopped tomatoes and all the remaining ingredients except lemon juice.
- When the tomatoes are soft, add water.
- Once the mixture boils, turn down the heat and simmer for 10-15 minutes.
- . Strain it after it cools down. Add lemon juice after it cools.
- Store the clear rasam at room temperature. It will store for a day.
- Add fresh coriander as garnish before serving hot rasam.

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### 5. Fresh Jal Jeera

#### Ingredients for 5-6 small glasses

- ½ cup of mint leaves
- 1 cup of fresh coriander leaves
- 2 inch by a 2inch piece of Ginger
- 1 Green Chilli
- One teaspoon roasted cumin seed powder
- Half teaspoon black pepper powder
- Lemon Juice – squeezed from 2-3 lemons ( 2-3 tablespoons)
- One to a two-inch piece of Jaggery
- Rock salt to taste

**Instructions:**

- Blend all ingredients in a blender at high speed with 5-6 glasses of water.
- Let the mixture sit for 1-2 hrs at room temperature.
- Strain mixture and store in a jug in the refrigerator.

Note: Adjust the taste of fresh Jal jeera by adjusting the amount of lemon juice, salt, jaggery, and chilies.

\*\*\*\*

**6. Lemon/ Curry Leaves/ Turmeric calorie-free drink**

**Ingredients: 5-6 servings**

- Two medium tomatoes finely chopped.
- Juice from two lemons (about two tablespoons)
- One teaspoons turmeric
- Half teaspoons mustard seeds
- Half teaspoon cumin seeds
- Green chilis to taste chopped fine
- Half inch piece of ginger pounded
- Eight to 10 curry leaves.
- Half teaspoon ground black pepper.

- One tablespoon ghee / or coconut oil.
- Salt to taste

**Garnish- Fresh** coriander leaves

### **Preparation**

Heat the ghee or coconut oil in the pan. When it is hot, add mustard seeds. As the seeds begin to crackle, add cumin seeds. Turn the fire down, add curry leaves, green chilies, chopped tomatoes, and ginger. Once the tomatoes are soft, add one liter of water, raise the flame to boiling point and then slow it down to medium, add turmeric. Let the mixture simmer for 8-10 minutes add salt. Add black pepper powder at the end. Strain the mixture. Before drinking, add a few drops of fresh lemon juice to each cup. You can store the drink in the refrigerator for two days. Warm it, and add a few drops of lemon juice before drinking.

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## **Breakfast Recipes**

### **1. Lentils with Millet/or Oats/ or cracked wheat (dalia) porridge with vegetables**

(Note: This preparation can be eaten at breakfast or as a soup for lunch  
The Millet and oats are gluten-free.

#### **Ingredients: Serves 2-4**

- Half Cup hulled Millet- South Indian white variety or steel-cut oats (gluten-free) or coarse Dalia
- Half cup lentils of your choice –split moong preferred but can use mixed lentils
- Half medium onion diced (optional)
- One green pepper diced

- Half cup carrots diced
- Fistful of green peas
- One medium potato finely diced (If diabetic cut down on potato)
- Two tomatoes diced into small pieces or blended
- One teaspoonful ginger pounded
- Half teaspoon cumin seeds
- Half teaspoonful mustard seeds
- One tablespoon cooking oil- Sesame oil or Coconut oil or a mix of the two
- Lemon juice from one lemon or one tablespoon or less per your taste
- Green Coriander and Curry leaves for garnish
- Salt to taste
- One tablespoon Roasted coarsely pound Peanuts or cashew nuts

#### **Preparation**

- Mix and soak oats/ millet/ or cracked wheat with lentils overnight.
- Cook oats/lentils mixture on the regular stovetop in 4-6 cups water until lentils are soft.

(Do not pressure cook as it overcooks the lentil and grains making these high glycemic and mushy)

- In another pot, heat oil add the mustard and cumin seeds.
- When seeds are cracking, add carrots, potatoes, curry leaves, ginger, and salt to taste.
- Once the potato is soft add tomatoes, green peas and green/ Red pepper, cook for 5-6 mins
- Finally, add the cooked oatmeal/or millet/or cracked wheat and lentil mixture.
- Simmer for 5 mins, add more water if needed to make the consistency of your choice.
- Add lemon juice and coriander for garnish.

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## **2. Quinoa or Coarse Cracked Wheat Vegetable Upma**

(Note; Suji or Upma is a high glycemic wheat grain product. Upma made from suji is, therefore, high glycemic. To make Upma low glycemic use either coarse grains such as fine cracked wheat or quinoa, which is a gluten-free grain.

### **Ingredients: Servings 4-5**

- One cup quinoa (red or white or a mix of the two) or one cup coarse cracked wheat
- 2 cups of water
- Half cup diced carrots
- One medium potato diced
- Half cup diced cauliflower
- Green chilies chopped fine
- Half cup diced tomatoes
- One medium onion chopped
- Few curry leaves
- Half teaspoon Jeera (cumin) seeds
- One tablespoon lemon or juice from 1 lemon
- Fistful of Peanuts or cashews
- Fistful of raisins
- One tablespoon of ghee or golden sesame oil or coconut oil (No refined oils please)
- Salt to taste

### **Garnish**

- Chopped fresh Coriander
- Roasted pounded Peanuts/ Cashews

## Preparation

- Soak the quinoa in water for at least 20 -30 minutes and rinse it thoroughly in a strainer to remove its bitterness.
- Put the quinoa or cracked wheat in a pan with 2 cups of water on high flame. Add one teaspoon of ghee or coconut or sesame oil. Let it boil until water runs low.
- Turn the flame to minimum, cover with a lid, so quinoa or cracked wheat simmer for 10 minutes until soft, and the tiny sprouts come out of the grain. Similarly, the cracked wheat should be soft but not mushy. Sprinkle little water and simmer more if that does not happen. The cooking process is complete when the grain is soft, and in the case of quinoa, the tiny sprouts appear.
- Pour the cooked quinoa or cracked wheat in a bowl, fluff it with a fork and set it aside.
- Take another Pan, put the remaining ghee or oil when hot add cumin seeds. Add onions and curry leaves when cumin seeds turn brown.
- Once the onions turn golden, add all the vegetables, including tomatoes.
- Add peanuts or cashews and raisins when the vegetables get cooked.
- Make sure not to overcook vegetables, keep these crisp.
- Add the cooked quinoa, mix well and simmer 3-4 minutes.
- Add salt and lemon juice to the mixture.
- Garnish with cilantro and roasted peanuts or cashews and serve.

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### 3. Quinoa Khichari or Soup

(Note: Quinoa grain is a gluten-free grain and a good source of protein)

**Ingredients:** Serves 3-4

- Half cup Quinoa soaked for 30- 60 minutes and rinsed well in a sieve (soaking and rinsing are necessary to remove the bitterness ).

- Half cup split moong dal with skin, or the whole moong soaked overnight
- One- two-tablespoon ghee.
- Half teaspoon mustard seeds
- Half teaspoons cumin seeds.
- Red chilies pods to taste
- Half teaspoon turmeric
- Pinch of Asafetida
- 8-10 curry leaves
- Salt to taste
- Half cup diced or grated carrots.
- Half cup green peas shelled and cooked
- Lemon juice to taste
- Four to 6 cups of water based on the final desired thickness consistency of the preparation.

#### **Garnish**

- Few sprigs of fresh coriander leaves

#### **Preparation**

Take a large pan, add the water. Once the water comes to boil, add soaked and rinsed quinoa and soaked moong dal. Let the mixture boil then simmer until dal is soft. Add the salt while simmering. Once the quinoa and lentil mixture gets cooked, add the tadka (garnish prepared as described below).

Heat the ghee in a skillet. Add mustard seeds first as these crackles add cumin seeds, red chili pods, curry leaves, asafoetida, carrots and green peas, and turmeric. When the vegetables get soft, add the mixture to the cooked quinoa, lentil, mixture.

Add lemon juice and fresh coriander garnish before serving.

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## **4. Ragi Uttapam**



## **Ingredients: Serves 3-4**

### **For Batter**

- Two cups ragi flour
- Half cup soaked rice
- Half cup homemade curd
- One teaspoon of pounded ginger
- Half teaspoon red chili powder.
- Half teaspoon cumin powder
- Eight to ten curry leaves
- Salt to taste.
- One cup of water
- Ghee or unrefined coconut water for pan-frying the uttapams

### **For Uttapam toppings**

- Half cup Spring onions diced thin ( optional)
- Green chilies diced
- Two medium tomatoes seeds removed and diced
- Capsicum green and red diced ( half cup)
- Carrots finely diced.
- Few green peas
- Fresh Coriander leaves chopped very fine.

### **Preparation**

To make the batter blend the rice with water in a high powered blender until smooth. Add ragi flour and curd and swirl lightly until well blended. Add chili, ginger, cumin powder, and curry leaves and blend for few seconds until curry leaves are shredded. Pour the batter in the bowl, add salt and stir well.

Use a nonstick griddle or pan, brush with little oil. Pour the batter when the frying pan is appropriately hot to make a small pancake. Put the topping mixture

on the top. Cover with a see-through lid. Cook on the medium flame for 3-4 minutes. Flip the uttapam and cook on another side for 1-2 minutes. The cooking time may vary depending on the thickness of the frying pan.

Serve the uttapam with green coriander-mint chutney or coconut chutney or sesame- flax seed chutney ( see the recipe below).

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## **5. Sesame /Flaxseed Seed Chutney**

(Note: Sesame seeds are a rich source of calcium and healthy monounsaturated fats. Two teaspoons (10gm) of sesame seeds carry 90mg of calcium in an easily absorbable natural form. Flaxseeds are a rich source of heart-healthy omega-three oils)

### **Ingredients:**

(Serve with fritters, cutlets, dosa, uttapam or as a side relish with meals)

- One cup sesame seeds soaked for 30-60minutes and then coarsely blended into a paste along with flaxseeds.
- One tablespoon flaxseeds
- Green Chillies to taste
- Ten to 15 curry leaves
- Two tablespoons lemon juice/or juice from 2-3 lemons
- Half teaspoon Cummin seeds
- Half teaspoons mustard seeds
- Two tablespoon ghee or unrefined coconut
- Salt to taste

### **Preparation:**

- Heat one tablespoon ghee or coconut oil in a skillet. When hot, add mustard seeds. Once these splutter add cumin seeds followed by green chillies and curry leaves.
- Slow down the flame, add the coarsely ground sesame/ flaxseed paste. Add salt to taste and turn off the flame.

- Add lemon juice when the mixture is cold
- Store the chutney in a glass container in the refrigerator (can store for 2-3 days).

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### **Super Green Breakfast smoothie**

*(Note- This 100% plant-based, Vegan Smoothie is a good breakfast option for those who have Diabetes, High Cholesterol, Heart disease, High Blood Pressure, and Fatty liver disease)*

**Super green smoothie is a rich source of:**

- **Antioxidants**- The cleansing agents that get rid of waste products from body cells and minimize inflammation (swelling).
- **Minerals**- The smoothie is rich in essential minerals such as calcium, Magnesium, Potassium, and iron.
- **Vitamins**
- **A right balance of protein, low glycemic carbohydrates, and healthy plant fats.**
- **Alkalinizing elements**- Vegetables and fruits are highly alkaline foods. In contrast, animal food products such as milk and meat and refined sugars make the body acidic. The human body is alkaline, the alkaline diet promotes health, and acidic diet encourages disease.

**Ingredients of Smoothie for two medium glasses:**

*(The smoothie is 100% plant-based, no milk products, no added oils or protein powder supplements).*

- **One cup packed with two green vegetables**- select from Spinach, kale, Bokchoy, green coriander leaves/ few mint leaves. Avoid salad green with high water content and bitter green vegetables like mustard and Methi. Spinach and fresh coriander with few mint leaves are the best options.

- **One cup packed with a mix of two fruits-** Banana is the preferred fruit. The other choices are mango, pineapple, grapes, apple, pear, and any other seasonal fruit of your choice. Avoid high water content fruits such as watermelon and cantaloupe or musk melon. Never add high glycemic dried fruits such as dried figs or apricots or dates.
- **Soaked almonds (5-7 pieces) and walnuts (2-3 pieces)** – Can also add 5-6 pieces of dry cashews.
- **Avocado (optional)** - If available, add only a quarter of the fruit. Too much avocado will make smoothie too thick.
- **Herbal spice boost-** Add a teaspoon of super herbal spice mix, which is rich in anti-inflammatory antioxidants. (See the recipe below)
- **Ashwagandha Powder (optional)** – One teaspoonful.

**Water-** Use 3 cups.

Blend all the above ingredients in a high powered blender, so the mixture is smooth and creamy.

**Chia seeds (Subja)** – Add one teaspoonful of chia seeds to the blended mixture. Let the smoothie sit for 5 minutes, so the chia seeds become soft. Add more water if needed to bring it to the consistency of your choice.

**Garnish (optional)** - To make smoothie look appetizing, you may garnish it with saffron, cardamom, and pistachio powder.

Use different choices of ingredients to make smoothies of varying taste each day.

## **Super Herbal Spice Powder**

*(Note- The Herbs and spices are medicinal supplements. The herbal spice mixture is an excellent nutritional supplement for food and lifestyle diseases including fatty liver)*

India is the land of spices and herbs, which have many beneficial health effects. Westerners sought to explore India, not for its riches but its spices. Many of the Indian herbs and spices have the established reputation of being useful in lowering blood sugar, blood cholesterol, blood pressure, help clear fatty liver and minimize body inflammation (swelling in body tissues). The medicinal herbs are potent antioxidants that remove the waste products and toxins from the body. The cleansing of the body tissues reduces swelling and inflammation. The inflammation in body tissues can be measured by a blood test called C Reactive Protein or CRP level. The level of CRP rises when there is silent body inflammation, which typically presents as general body aches and joint pains. The well-known spices and herbs which provide these health benefits include:

- Cinnamon (दाल-चीनी)
- Turmeric (हल् दी)
- Ginger (अदरक)
- Black Pepper (काली मिचच)
- Fenugreek seeds (िैथी दाना)
- Cloves (लॉग) - use it in winter, it is a powerful antioxidant
- Flaxseeds (अल् सी)

### **Preparation of Herbal Spice Mix**

Consuming each spice individually becomes cumbersome. Therefore, it is a good idea to make a powdered mix of all these herbs. Store the powdered spice mix in a glass jar in the refrigerator. You may add one teaspoonful to your breakfast smoothie or spread on the salad or add to raita or add to a glass of water and drink it in the morning. Cooking and heating damages the healthy omega three oils and potency the spices.

INGREDIENTS	AMOUNT
Cinnamon	100mg
Fenugreek seeds	100mg
Turmeric	100mg
Dry ginger	100mg
Flaxseeds	100mg
Black pepper	50mg
Flaxseeds	50mg
Cloves (use in water)	10-15 pieces

Grind all of the above ingredients and strain it in a fine sieve to make a fine powder. Store in a glass jar (never in a plastic container) in the refrigerator.

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### **Ashwagandha (Indian Ginseng- Plant Withania Somnifera)**

Ashwagandha root powder is a potent herb used in Ayurveda for more than 4000 years. It is a herb that increases Insulin sensitivity and secretion and lowers blood sugar. It may also lower cholesterol and triglycerides. Additionally, ashwagandha is known to reduce the level of the stress hormone cortisol, thereby minimizing stress, anxiety, depression, and improving sleep. All these effects also reduce body inflammation. Ashwagandha root powder is available from many resources- Patanjali, Dabur, Jain Ashwagandha powder, Herbal hills and more. Buy a reputable organic preparation. Use the dose recommended by the manufacturer and it may vary from 250-500mg. The powder can be added to the green breakfast smoothies.

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## **Salads**

### **1. Beet Root, Spinach, kale salad:**

#### **Ingredients:**

- A handful of spinach leaves chopped
- A handful of kale leaves finely chopped or available salad green mix.
- One to two beetroots cooked firm and finely chopped ( one to two cups)
- One tablespoon grated fresh coconut
- One tablespoon soaked walnuts chopped coarsely (can replace with peanuts)

#### **Salad Dressing:**

- Half medium or one small cucumber
- Half cup fresh coriander and mint leaves mix
- Quarter teaspoonful roasted cumin powder
- Juice of one lemon ( one to two teaspoons)
- One teaspoon of Sesame and flaxseed powder
- One tablespoon Sesame oil or extra virgin olive oil

Blend all the above dressing ingredients into a creamy mixture. **DO NOT ADD SALT TO DRESSING.** Store the dressing in the refrigerator until salad is ready to serve.

#### **Preparation:**

Just before serving, toss the ingredients with the dressing in a bowl. Add the grated coconut and walnuts on. The guest can sprinkle pink salt or desi- namak before eating to their desired taste.

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## **2. Quick desi peanut salad/ Snack**

### **Ingredients: serves 2-4**

- Half cup soaked peanuts and almonds ( soaked overnight)
- One cup diced cucumber half-inch pieces
- Two tablespoons of finely chopped coriander and mint leaves
- One to two finely chopped green chilies.
- One teaspoon of sesame flax seed powder
- One teaspoon of dark brown jaggery or coconut sugar
- Two to three teaspoons of freshly grated coconut
- One tablespoon fresh lemon juice

### **Preparation:**

Mix all above in a bowl and add Himalayan pink salt or desi namak just before serving

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## **3. Nature Salad:**

### **Ingredients: Serves 3-4**

- Two medium cucumbers
- Two carrots
- Four tomatoes
- One large red or yellow pepper (Please note- do not eat green pepper raw as it is harsh on stomach)
- One cup fresh coriander finely chopped
- One tablespoon pomegranate seeds ( Optional in season)
- Two tablespoons fresh grated coconut
- One teaspoon black sesame seeds



- Fresh lemon juice to taste

**Preparation:**

- . Dice cucumber, carrots, tomatoes, and peppers into pieces.
- Add finely chopped coriander.
- Add the grated coconut and sprinkle black sesame seeds
- Mix all the ingredients, add the lemon juice, and stir well.

Note: No salt is required for this salad, as the combination of coriander and coconut gives it a delicious fresh flavor.

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**1. Teen Murti: Multi-Nutrient Mix salad**

This salad has multiple natural ingredients, which makes it a complete meal by itself with a proper balance of low glycemic carbohydrates, vegetarian protein, and healthy unsaturated vegetable fats. It is also a rich source of micronutrients such as vitamins, minerals, and body cleansing antioxidants. Additionally, raw foods are live foods that maintain all the nutritional value of the food. Fifty percent of vegetables should be consumed in natural raw form as salads and smoothies.

**Ingredients:** Adjust the ingredient amount based on the number of servings to be made.

- Choice of 3 Seasonal vegetables - Tomatoes, Cucumber, Radishes, salad greens, avocado, turnips, green peas, green chana, broccoli (lightly steamed or blanched).
- Half to one cup of 3 seasonal fruits (less fruit for a diabetic patient)
- Half a cup of three sprouts- Fenugreek (Methi) seeds, Moong, Matki, Masoor, Brown, or yellow chickpeas (cooked). Cut down the amount of sprouts if there is kidney disease, such as in a diabetic patient.
- Small fistful of mixed nuts—Select from almonds, walnuts, peanuts, pistachio, and cashews.
- One to two teaspoons of seeds— Select from Flaxseeds (Alsi), Sesame seeds, melon seeds, pumpkin seeds and chia (subja seeds). Flaxseeds and

sesame seeds have thick skins that are hard to digest, so grind these before use. Never toast or heat seeds before use because heating removes the healthy omega-three oils of the seeds. Sesame and flaxseeds ground mixture can be stored in the refrigerator for 2-3 weeks.

Salad Dressing ingredients: For a large bowl of salad

- One tablespoon (equal to 3 teaspoons) of Apple cider vinegar or lemon juice.
- One to two teaspoons sesame oil.
- Pinch of Black pepper.
- Pinch of cumin powder.
- Salt to taste ( use desi namak or Kala namak)

Whisk the ingredients well with a fork and add to the mixed bowl of salad ingredients immediately before serving. Do not add salad dressing beforehand as the vegetables and fruit will lose their water and become limp.

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## **5. Tomato Corn Salad**

**Ingredients: serves 4-6**

- Six ripe red medium tomatoes cut into one-inch cubes. Store in the refrigerator in a bowl
- Two large chili pepper or one large Jalapeno pepper
- One cup fresh coriander chopped
- Two cups corn Kernels
- Two to three green onions (scallions) cut in small pieces about a half cup.
- One tablespoon extra-virgin olive oil/ golden yellow sesame oil (one of the two).
- Two tablespoons ( juice from 2 lemons)
- Salt to taste
- Chinese snow peas 10-12 cut into thin slices

## Preparation

- Take the chili pepper and corn smear well with oil.
- Take a heavy bottom skillet and pan-fry the corn and chili pepper until corn is golden brown
- Separate the chili pepper; let it cool. Cut the pepper and remove the seeds, keeping some.
- In a food processor coarsely blend half the corn, roasted chili pepper, coriander leaves, half the green onions, and lemon juice.
- Bring the tomato bowl out of the refrigerator, add the mixture from the blender, sugar snap peas, remaining green onions and mix well
- DO NOT add salt until you are ready to serve the salad. If you add salt beforehand, the entire mixture will become watery and lose its texture and taste

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## Soups

### 1. Mixed Vegetable Soup

#### Ingredients: Serves 6

- One cup cooked Rajma beans
- Two tablespoon ghee or butter or sesame oil
- Five to six cups of water
- Two green Onions with stems washed and chopped
- Two carrots finely diced
- One medium or two small potatoes cut in half-inch cubes.
- One cup of green beans cut into half-inch pieces.
- One small zucchini or Turai peeled and cut into half-inch pieces
- One cup shelled green peas.
- Two medium tomatoes seeds removed and chopped into small pieces.

- Half cup of chopped spinach
- Green chilis to taste.
- Two cloves of garlic ( or one teaspoon cumin seeds)
- Salt to taste
- Bay leaves 3-4 pieces
- One to 2 cloves.
- Two-inch piece of ginger pounded.
- Salt to taste
- Two tablespoons of lemon juice or juice from two lemons.

### **Garnish**

- Fresh Coriander leaves
- Black pepper powder or red chili flakes
- Green chilies chopped fine ( optional)

### **Preparation**

- Heat the ghee, butter or sesame oil in the pan
- Add the cumin seeds or onions and garlic depending on your choice.
- Slow the flame, add bay leaves, cloves, and ginger
- Add carrots, potatoes and green beans, stir for 3-4 minutes and add 5-6 cups of water.
- Put the flame high to boil. Once it starts boiling, turn the flame down to medium.
- Simmer for 10 mins and then add all the remaining vegetables, cooked beans, and continue to simmer until potatoes and carrots are soft but not mushy.
- Add the spinach and let it wilt 3-4 minutes.
- Add the lemon juice before ladling the soup into the serving bowls.
- Garnish each bowl with fresh coriander leaves, black pepper, chili flakes
- Add salt to taste just before eating

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## 2. Raw Tomato Red Bell Pepper Soup

### Ingredients: Serves 4-6

- Six to eight medium tomatoes (seeded and cut in cubes)
- One red bell pepper (medium) seeded and cubed
- Half orange or yellow bell pepper seeded and cubed. If not available, use a little more red pepper. ( Note: Green bell pepper if eaten raw irritates the stomach)
- 4-5 walnut halves or 8-10 cashews or 8-10 blanched (skin removed) almonds
- Two cloves garlic ( Optional)
- Four to 5 sundried tomatoes soaked in water for a half-hour or 4-5 olive oil marinated sundried tomatoes
- Red Chili powder to taste
- ½ teaspoon cumin powder
- One tablespoon lime or lemon juice
- One tablespoon of extra virgin olive oil or golden sesame oil
- Salt to taste
- Four cups of boiling water

### Garnish

- Black Pepper powder
- Few sprigs of fresh coriander
- Toasted walnut pieces

### Directions

- In a high-speed blender, blend all the ingredients except hot water until smooth.
- Just before serving (plating) add hot water and whisk few times).
- Garnish with cilantro leaves and toasted walnuts and sprinkle black peppercorn powder to taste.
- Serve the soup immediately after adding warm water and salt to taste.

*(Note: Never warm or heat raw soups as they will lose the texture. Eat them cold or warm)*

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### **3. Zucchini or Turai soup with Corn and Spinach**

#### **Ingredients: Serves 4**

- One medium onion chopped
- Two cloves garlic chopped
- One pound. zucchini or turai (3 medium) peeled and chopped
- Three cups vegetable broth (or water)
- Ten to twelve cashews or some number blanched almonds or fistful of soaked peanuts
- Half cup corn kernels
- Half cup baby spinach chopped
- Himalayan pink salt to taste
- Half teaspoon cumin seeds
- Black pepper to taste (can use Thai green chili )

#### **Garnish**

- Dry toasted Corn ( See below)
- Black peppercorn powder
- Few sprigs of fresh coriander

#### **Preparation**

- Put three cups vegetable broth or water into large pot and bring to boil.
- Add onions, garlic, zucchini, cumin seeds, green chilis, and cashews/ almonds or peanuts into the pot.
- Cook the mixture for 20-25 minutes until zucchini softens.
- While the vegetables are boiling, dry toast the corn kernels in a skillet until golden brown. Set these aside.
- Cool the cooked mixture of zucchini, and blend until smooth and creamy.
- Return blended soup into pot and bring to boil. Add the spinach to soup and cook for 5 minutes until spinach gets wilted.
- Add the salt before pouring the hot soup in serving bowls. Add the toasted corn, fresh coriander.

- Sprinkle desired amount of peppercorn.

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#### **4. Green Moong Bean Soup with Vegetables**

(Note: This basic soup recipe can make many different soups based on the ingredients used)

Ingredients: For 3-4 servings

- One cup cooked Green Moong or Beans of your choice (black eye or rajma or chauli or Bengal gram or yellow chana -chickpeas) or fresh green peas in season.
- Two cups of at least 3 Seasonal Vegetables chopped to one-inch cubes (carrots, sweet potato, Zucchini, Turai, Lauki or Bhopla, Pumpkin).
- One cup finely chopped spinach or any other green vegetable of your choice.
- Two teaspoon ghee or unrefined virgin coconut oil.
- One level teaspoon Cumin Seeds.
- One to two green chilies chopped to taste
- Two-inch piece fresh ginger pounded
- One inch piece fresh turmeric pounded or half teaspoonful turmeric powder.
- Desi salt to taste ( never add salt during cooking, or the vegetables will lose their natural color
- One tablespoon fresh lemon juice
- Few sprigs of curry leaves for flavor
- Few sprigs of fresh coriander for garnish. One can also add roasted and pounded peanuts for garnish.

**Preparation:**

- Prepare the whole Moong or lentils in the usual manner by overnight soaking, followed by pressure cooking. Add more water during cooking. Strain the Moong and lentil. Use the leftover water as broth for cooking the vegetables.
- Take a medium or large pan. Heat the ghee or coconut oil, add cumin seeds followed by green chilies and curry leaves.
- Add all the cut vegetables and boil on medium heat until slightly tender. Preferably cook uncovered to preserve the fresh color of the vegetables. Do not overcook vegetables. Overcooked mushy vegetables lose their nutritional value.
- Add Ginger and turmeric
- Add finely chopped spinach or green vegetables, cook for 3-5 minutes until leaves get wilted again taking care not to make these too mushy and overcooked.
- Immediately before serving, add salt, lemon juice, and garnish with fresh coriander and roasted pounded peanuts.

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## Nutritious Chapatti

### Multigrain Chapatti Flour

This chapatti flour is low in gluten, rich in fiber, vitamin B, other minerals, and heart-healthy omega-three oils. Makes the most nutritious chapattis in our ancestral tradition)

### Ingredients—for one Kilo Multigrain Flour

- Wheat – One kilo ( 1000gm)
- Barley( Regular or Pearled )-100gm
- Millet ( Hulled south India variety whitish to yellow)--100gm
- Oats ( Jau)– 100gm
- Sorghum ( Jawar)--100gm



- Raghi (also called finger millet)-100gm

(Note: To increase protein content, replace any other grain with more raghi grain. In case the dough is difficult to roll into chapattis because of less gluten, add little of store-bought wheat flour to the desired consistency of rolling. Keep in mind that if the dough has too much elasticity, there is an unhealthy large amount of gluten in the dough. Gluten is what gives the dough its flexibility.

### **Grain Grinder**

Several kitchen grains- grinding machines are available in India at an affordable price range of INR 15-18,000. An investment in kitchen grain grinding machine will pay itself off within a couple of years.

### **Grain Preparation**

Mix all the grains and store the grain mixture in an airtight container at room temperature. It is optimal to grind the flour fresh, making about two weeks' worth at a time. If you wish to make more flour, store extra flour in the refrigerator to avoid it from going rancid (bitter).

### **Dough Preparation**

It is preferable to make dough with warm to hot water. Heat brings out the gluten protein and makes the dough more workable. That is important when you wish to make chapattis out of low gluten multigrain flours.

Multigrain flour prepared above has low gluten content and is rich in fiber, mineral, vitamins, and healthy oils. To further minimize the overall gluten content in the final dough, you can add the following ingredients, and make many varieties and flavors of chapattis:

- **Avocado** – Blend avocado in a food processor before adding to the flour. Add lemon juice while making dough to prevent the dough from getting dark in few hours.
- **Methi leaves /Jeera/Cumin seeds** – In a tablespoon of oil stir fry jeera, salt, meth leaves, and green chilies to taste. Add the mixture to the chapatti flour when making the dough.

- **Mixed lentils** – Soak the lentils of your choice overnight. Cook them in a small amount of water until soft. Add this to the flour along with spices of your choice (salt, chilies, cumin, etc.) while making the dough.
- **Mixed Vegetables** – Collect all the leftover vegetables from the refrigerator --zucchini, Turai, carrots, spinach, green chilies, green peas, fresh coriander, and grind these in the food processor. Add the vegetable mixture to flour when making the dough. Add cumin seeds, salt, condiments of your choice.
- **ENJOY Nutritious chapattis low in gluten, rich in fiber, vitamins, and minerals!!**

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