

Our traditional rice varieties will make the nation healthy

Dr Sirimal Premakumara & Dr Kanchana Abeysekera

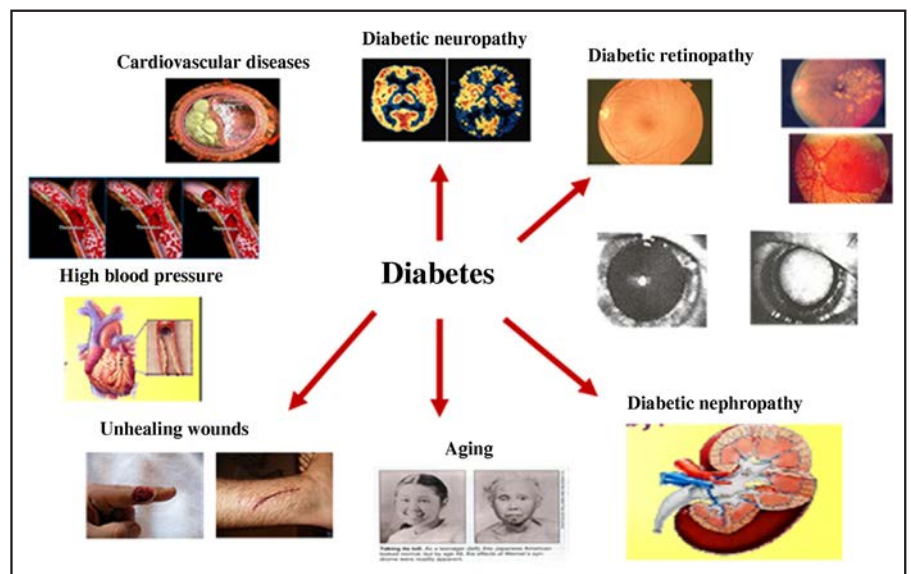


We have heard that our ancestors were a generation of active and healthy people. But the present generation is very busy and is subjected to many non-communicable diseases. Now the time has come for us to take steps to rid ourselves of non-communicable diseases and produce a healthy generation. It is the wrong type of food pattern that has invited many of these non-communicable diseases. Research conducted by Dr Sirimal Premakumara who is a senior Lecturer at the University of Colombo (and formerly the Director General of ITI (Institute of Technology), and Dr Kanchana Abeysekera, formerly a research officer at ITI on nutritional and medicinal properties of the traditional rice varieties of Sri Lanka, has revealed that the solution for many non-communicable diseases could be the consumption of indigenous and traditional rice varieties.

Rice is cultivated in about 100 countries world wide. Rice is the staple diet of about half the world population. 27% of the daily energy requirement, 20% of the

daily protein requirement, and 3% of the daily fat requirement are provided by rice in the developing countries. In Sri Lanka too the staple food is rice, and the per capita consumption of rice is approximately 110kg per year. Our country has been self sufficient in rice since 2005 and presently produces rice even for export to other countries. The department of Agriculture has introduced about 50 improved varieties of rice for this purpose. According to the 2002 Annual Report of the World Health Organization, the main cause for the rapid increase of non-communicable

diseases is due to moving away from the traditional food patterns. Therefore consuming food which is nutritional and functional helps to prevent and control these diseases. Functional foods are those foods containing proteins, carbohydrates, fats, minerals and vitamins as the main components. In addition functional foods have other chemical substances which would improve the nutritional status and health. Therefore by consuming functional foods replete with nutrients help to control and prevent such diseases. In countries where the staple food is rice, by identifying the rice varieties containing the functional components with more nutritional



Our traditional rice varieties will make the nation healthy

value, it is possible to control and prevent the occurrence of non-communicable diseases. There is evidence that in Sri Lanka there were about 2000 varieties of rice which were indigenous and traditional.

Given below are a few traditional rice varieties of Sri Lanka with their nutrient and medicinal properties.

Mawee - controls diabetes, constipation, obesity. Improves body strength.

Suwandel - Supports body growth, and is suitable for controlling diabetes.

Kalu Heenetti - Improves body growth, and reduces toxins in the body.

Pokkali - Suitable for controlling diabetes, and for prevention of nerve and skin diseases.

Dabanata - Suitable for control of kidney diseases and cancer.

Kurulu Thuda - Suitable for control of urinary diseases, and improves body strength.

Hetada Wee - Suitable for control of constipation.

Madathawalu - Suitable for control of diabetes and ailments arising due to the three types of *doshas* (disorders) *Vatha*, *Pitha* and *Kapha*

Described below are some investigations carried out by Dr Kanchana Abeysekera and Dr Sirimal Premakumara on the nutritional and medicinal properties of some traditional rice varieties in Sri Lanka.

Diabetes is a non-communicable disease which is developing rapidly in Sri Lanka. Given below are some data regarding diabetes in Sri Lanka:

- Diabetes 10%
- Future probability for developing diabetes 11.5% :
In urban areas - 16.4%
In rural areas - 8.7%

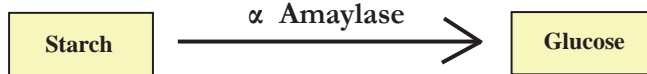
Research carried out on diabetes

- Activity of the enzyme α - amylase
- Protein glycation reaction
- Ability to reverse the Protein glycation reaction
- Glycemic Index
- Activity of the enzyme Choline esterase
- Research carried out administering extract to rats

Activity of the enzyme α - amylase

Amaylase is one of the main enzymes involved in the digestion of starch.

Scientific research has shown



that chemical compounds which can reduce the activity of the enzyme amylase can reduce the rate of starch digestion. Research conducted using the extracts from the bran of traditional rice varieties has confirmed that the rice bran contains active ingredients which can reduce the activity of the enzyme amylase. This property is much higher in the red rice varieties when compared with white rice. Of the red rice varieties *Masuran*, *Sudu Heenetti*, *Dik Wee* and *Goda Heenetti* have been shown to exhibit this property at a much higher level.

Protein Glycation reaction

When the blood sugar level increases in diabetic patients a

reaction takes place between the sugar and proteins. This is called the millar reaction. This is not an enzyme catalyzed reaction. The end products of the reaction are compounds known as Advanced Glycation end products - AGES.

The formation of these products takes place slowly inside the body. Scientific research has shown that these products are directly associated with the side effects of diabetes such as kidney diseases, nerve diseases and heart diseases. It has been shown that of the rice varieties tested *Sudu Heenetti*, *Goda Heenetti*, *Masuran* and *Dik Wee* have the highest ability to prevent these disease conditions developing.

Protein Glycation reversing ability

The identification of chemical compounds which can reverse the formation of advanced Glycation end products is useful in the control of diabetes.

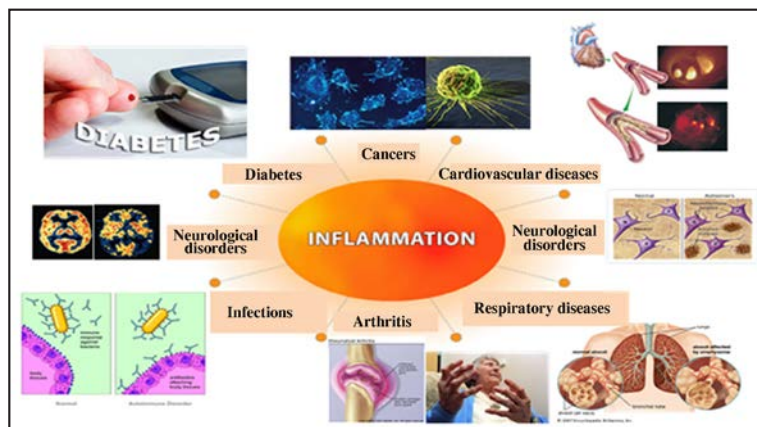
This ability to reverse protein glycation is shown to a high extent by *Sudu Heenetti*, *Goda Heenetti*, *Masuran* and *Dik Wee*.

Glycemic Index

This is an index indicating the level of blood sugar content when starch is digested. The value of this index is given relative to that of white bread and glucose.

Low glycemic index < 55
Mediam glycemic index 55-69
High glycemic index > 70

By experiments carried out, it has been found that the rice varieties



masuran, *Sudu Heenetti* and *Dik Wee* show a low rate of starch digestion relative to white bread.

Activity of the enzyme choline esterase

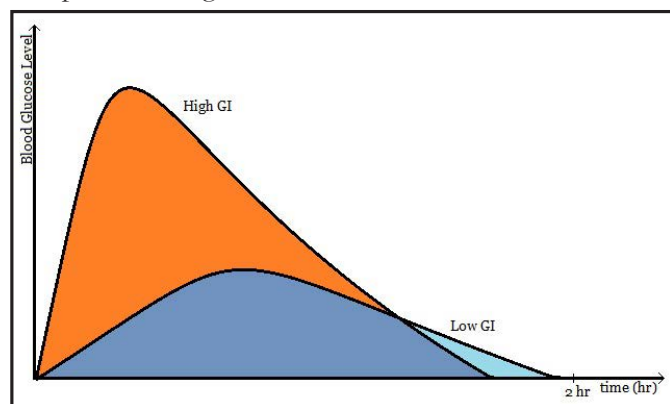
Chemical compounds which can reduce the activity of choline esterase help in the control of diabetes. Among the rice varieties studied *Sudu Heenetti*, *Goda Heenetti*, *Masuran* and *Dik Wee* have a high value for this property.

Research carried out administering extracts to rats

By these experiments it has been shown that the rice variety *masuran* is specially suitable to prevent the increase in blood glucose level.

Research regarding cancer

Cancer is a disease inflicting people irrespective of age. The research



conducted has shown that rice varieties *Sudu Heenetti*, *Goda Heenetti*, *Masuran* and *Dik Wee* are suitable to inhibit

or reduce cancers such as breast cancer, stomach cancer, cancers of the alimentary tract, lung cancer and womb cancer.

Research carried out regarding inflammatory diseases

During inflammatory diseases free radicals with high activity are formed.

The relationship of inflammatory diseases with other diseases

When the ability to neutralize the free radicals and reduce the formation of cytokinins when inflammation occurs was investigated, it was found that these effects were high in *Sudu Heenetti*, *Goda Heenetti*, *Masuran* and *Dik Wee*.

Research conducted regarding antioxidant properties

Compounds with oxidizing properties are produced in our bodies. These compounds with antioxidant properties are neutralized by enzymes

and by compounds possessing antioxidant properties. During disease conditions the rate of production of compounds with oxidizing properties is more than the rate at which these compounds are neutralized. Scientific research has shown that this is the reason for the development of non-communicable diseases.

Therefore providing compounds with antioxidant properties through diet is beneficial in controlling non-communicable diseases. Of the rice varieties tested *Sudu Heenetti*, *Goda Heenetti*, *Masuran* and *Dik Wee* have high values for these properties.

Accordingly if we tend for consume our indigenous traditional rice varieties it may be possible to avoid being subjected to many non-communicable diseases.

Dr Sirimal Premakumara

BSc,PhD,Dip(Psy),MIBiol, MIChemC,CChem,CBiol,FIBiol Senior Lecturer
Dept.of Basic Science & Social Science
Faculty of Nursing
University of Colombo, Colombo 3
TP: 0094777316563
Email: sirimal@dss.cmb.ac.lk

Dr Kanchana Abeysekera

BSc,MSc,PhD,MIBiol,CBiol Senior Lecturer
Dept.of Agricultural Technology
Faculty of Technology
University of Colombo, Colombo 3
TP: 0094772933871
Email: kanchana@at.cmb.ac.lk

