

Food Technology Congress 2018 : BEARCHOL - Tempeh Mold-Fermented Rice Bran Water Extract Improves Lipid Profile in Hypercholesterolemia Rats - Nurrahma Bira Arumndari - Universitas Gadjah Mada – INDONESIA**Nurrahma Bira Arumndari***Universitas Gadjah Mada – INDONESIA*

Hypercholesterolaemia is risk factor for non-communicable disease. Dietary fiber consumption is known to lower blood cholesterol level. One of food ingredients which is known to contain high dietary fiber is rice bran. The content of dietary fiber and γ -oryzanol in bran is known to be capable in lowering cholesterol by lowering cholesterol absorption and increasing its excretion. The potency of bran in lowering cholesterol may increase if fermentation is done. Thus, this study aims to determine the effect of tempeh mold-fermented rice bran water extract on lipid profile in hypercholesterolemic rats. Method: Rice bran is fermented with the commercial tempeh mold known as Raprima® and extracted with aquadest. Twenty-four male Sprague dawley rat was divided into 4 groups, namely normal control (NOC), negative control (NEC), RBE1, and RBE2. Induction of hypercholesterolemia is performed on all groups except NOC. RBE group is given fermented rice bran water extract with doses of 1102.5 mg/kg body weight (RBE1) and 2205 mg/kg body weight (RBE2). The hypercholesterolemia model is made by giving high-fat high-fructose diet. Lipid profile is measured and One Way ANOVA is used for parameter analysis with significance $p < 0.05$. Results: Groups given fermented rice bran water extract have lower total cholesterol, triglyceride, and LDL levels as well as levels HDL was significantly higher ($p < 0.001$) than NEC. There's a decrease in total cholesterol and triglycerides also an increase in HDL levels in RBE2 compared to RBE1. Conclusion: tempeh mold-fermented rice bran water extract improves lipid profile in hypercholesterolemic rats. Familial hypercholesterolaemia is a monogenic disorder commonly associated with the premature coronary artery disease. Mutations are most commonly and frequently found in LDL receptor gene. Clinical equipment can be used to diagnose but genetic testing will only confirm the disorder. This is very useful for cascade screening. Early recognition, prediction and

appropriate treatment will help to improve prognosis and reduce negative clinical cardiovascular outcomes. People who are suffering from Familial hypercholesterolaemia are considered to be at higher cardiovascular risk and the treatment target is said to be LDL cholesterol < 2.6 mmol/L or at least 50% reduction in LDL cholesterol. Patients with this disorder will be requiring intensive treatment with statins and ezetimibe and colesvelam. Recently, some inhibitors called proprotein convertase subtilisin/kexin type 9 inhibitors are approved to manage the familial hypercholesterolaemia.

Fruits and vegetables contain fibre and antioxidants, which have been associated with lowering cholesterol levels. A balanced diet should include at least five portions of fruit and vegetables per day. These can be fresh, frozen, dried or canned. A portion of fresh fruit or vegetables is roughly 80g or 1 handful. For dried fruit the portion size is half a handful, as the fruit will be more concentrated. To get the most benefit, aim for as many different types of fruits and vegetables as you can. Wholegrain carbohydrates – such as those found in wholemeal (brown) bread, wholegrain cereals. This is important as too much bad cholesterol can cause fatty material to build up in your artery walls. This fatty material can make your arteries get narrower or blocked up and increases your risk of having a heart attack or stroke. Porridge oats also contain beta-glucans, which can help reduce the absorption of bad cholesterol in your gut. Drinking too much alcohol is associated with increased levels of triglycerides, as well as contributing to weight gain and liver problems. The recommended levels are no more than two to three units per day for women and three to four units per day for men. It is also recommended that you have two drink-free days per week.

One unit of alcohol is the equivalent to:

- half a pint of ordinary-strength beer or cider

- One small glass of wine
- One single measure of sprit
- One small glass of sherry

Ways in which you can reduce your alcohol intake may include:

- topping up your wine or beer with a diet soft drink to make a spritzer or shandy
- using a smaller glass
- having a soft drink in between drinks
- using a phone app or written diary to keep an eye on your daily intake.

Nuts contain good fats, fibre, minerals and antioxidants. They are also a great snack. There is no current recommendation for which nuts are most beneficial, but for the most impact a portion size of 30g or half a handful of nuts per day is recommended. It important to note, however, that nuts are high in calories and that consuming large amounts can contribute to weight gain. Oily fish contain good fats, which can help reduce your risk of heart disease. These fish include salmon, mackerel, sardines, herrings, anchovies and trout. The recommendations for a healthy heart are two portions per week.

Physical activity may help to raise your good cholesterol levels. To reduce your risk of cardiovascular disease 150 minutes (two and a half hours) of moderate-intensity activity per week is recommended. This can be split up into 5 x 30-minute sessions. Moderate intensity exercises include those where your heart rate is raised and you are sweating. These include jogging, cycling and aerobics. Try incorporating physical activity into your daily routine, eg cycling or walking to work or taking the stairs instead of the lift. Smoking is the biggest risk factor for cardiovascular disease as it contributes to high blood pressure and reduces your good cholesterol levels. Even though salt do not affect the cholesterol levels in your body, high levels of salt intake may increase blood pressure which might act as another risk factor for cardiovascular disease. The recommended intake of salt is less than 6g per day. This is the same as around one teaspoon of salt per day. Preparing food with starch may help you reduce the high salt intake. This way you can control the amount of salt in your food. You can also use herbs and spices to improve the flavor of your foods. Some of the

lifestyle choices which helps to increase the HDL and decrease the LDL are:

1. Focusing on monosaturated fats
2. Using polyunsaturated fats especially omega3s
3. Avoiding Trans fats
4. Eating soluble fiber
5. Exercise
6. Losing weight
7. Quitting smoking
8. Using alcohol in moderation
9. Considering plant sterols and stanols
10. Trying supplements