



## Irritable bowel syndrome and low FODMAP diet

### Introduction

Irritable bowel syndrome (IBS) is a functional disorder of the gastrointestinal (GI) tract which has a significant impact on quality of life. It is characterized by chronic abdominal pain and altered bowel habits in the absence of a significant structural or an organic cause. Prevalence of IBS among Sri Lankan adolescents is 7%<sup>1</sup> compared to 3 - 20% range seen in population based studies in Western countries<sup>2</sup>.

IBS is a clinical diagnosis and Rome IV criteria is used to diagnose it if other organic causes are excluded. Rome IV criteria considers recurrent abdominal pain or discomfort at least 1 day a week in the last 3 months, associated with two or more of the following:

1. Symptoms improved by defecation
2. Onset associated with a change in frequency of stool
3. Onset associated with a change in the form or appearance of stool.

IBS can be sub classified into IBS with diarrhea (IBS-D), IBS with constipation (IBS-C), mixed IBS (IBS-M), or unsubtyped (IBS-U) based on their predominant bowel pattern.

Pathophysiology is explained as a result of altered gastrointestinal motility, visceral hyperalgesia and psychopathology<sup>3</sup>. Factors that can trigger the onset are affective disorders, psychological stress and trauma, gastrointestinal infection, antibiotic therapy, pelvic surgery, eating disorders and certain foods. Providing psychological support and dietary modifications are considered as primary management options and pharmacological treatment is adjunctive. Fibre supplementation, caffeine avoidance, gluten free diets, probiotics and low FODMAP diet are the dietary modifications used.

### What is FODMAP diet?

The acronym FODMAP stands for fermentable oligosaccharides, disaccharides, monosaccharides and polyols. They are naturally occurring components of foods which are chemically described as poorly absorbed short chain fermentable carbohydrates.

As they are poorly absorbed, significant proportion enters the distal small intestine and colon, where due to osmotic effects the water content is increased. This provides a substrate for bacterial fermentation, which results in increased gas production leading to abdominal distention and discomfort.

They also act as prebiotics helping colonization of the large intestine with bacteria, resulting in gas production due to fermentation. Increased luminal pressure and chemicals affect endocrine cells that regulate gastrointestinal functions such as sensation, motility, secretion and absorption, as well as local immune defense and food consumption<sup>4</sup>.

Hence, a diet low in FODMAP helps to minimize the symptoms caused by IBS.

## What are the evidences to show that low FODMAP diet reduces symptoms?

A single-blind, crossover intervention trial involving fifteen with IBS (Rome III criteria) and 15 healthy individuals in Australia consumed diets that were either low (9 g/day) or high (50 g/day) in FODMAPs for 2 days<sup>5</sup>. Results showed that dietary FODMAPs induce prolonged hydrogen production in the intestine that is greater in IBS, influence the amount of methane produced, and induce gastrointestinal and systemic symptoms experienced by patients with IBS.

In a controlled, cross-over study of patients with IBS in Australia<sup>6</sup> involving 30 patients with IBS and 8 healthy individuals, a diet low in FODMAPs effectively reduced functional gastrointestinal symptoms (overall gastrointestinal symptom scores - 22.8; 95% confidence interval, 16.7-28.8 ) compared with the Australian diet (44.9; 95% confidence interval, 36.6-53.1 ; P < .001).

A multi-center, parallel, single-blind study involving 75 patients who met Rome III criteria for IBS was done in Sweden and it showed a diet low in FODMAPs reduces IBS symptoms as well as traditional IBS dietary advice<sup>7</sup>. So they concluded that combining elements from these 2 strategies might further reduce symptoms of IBS.

A study done in UK aimed to determine whether a low FODMAP diet is effective for symptom control in patients with IBS and to compare its effects with those of standard dietary advice based on the UK National Institute for Health and Clinical Excellence (NICE) guidelines<sup>8</sup>. Significantly more patients in the low FODMAP group compared to the standard group reported improvements in bloating, abdominal pain and flatulence. In conclusion, low FODMAP diet appeared to be more effective than standard dietary advice for symptom control in IBS.

In summary high FODMAP diet has induced GI symptoms while low FODMAP diet reduced it and low FODMAP diet appeared to be more effective than standard dietary advice.

## What are the low FODMAP foods?

**Table 1: Low and high FODMAP food chart (source; [www.IBSDiets.org](http://www.IBSDiets.org))<sup>9</sup>**

	<b>Low FODMAP</b>	<b>High FODMAP</b>
<b>Vegetables and legumes</b>	Bamboo shoots, Bean sprouts, Broccoli , Cabbage (common and red), Carrots, Celery (less than 5cm stalk), Chick peas (1/4 cup max), Corn (1/2 cob max) , Courgette , Cucumber, Eggplant , Green beans, Green pepper, Kale, Lettuce (e.g. Butter, iceberg, rocket), Parsnip, Potato, Pumpkin, Red peppers, Scallions / spring onions (green part), Squash, Sweet potato, Tomatoes, Turnip	Garlic, Onions, Asparagus, Beans (e.g. black, broad, kidney, lima, soya), Cauliflower, Cabbage( savoy), Mange tout, Mushrooms, Peas, Scallions / spring onions (white part)

<b>Fruit</b>	Bananas, Blueberries, Cantaloupe, Cranberry, Clementine, Grapes, Melons e.g. Honeydew, Galia, Kiwifruit, Lemon, Orange, Pineapple, Raspberry, Rhubarb	Apples, Apricot, Avocado, Blackberries, Grapefruit, Mango, Peaches, Pears, Plums, Raisins, Sultanas, Watermelon
<b>Meat and substitutes</b>	Beef, Chicken, Lamb, Pork, Quorn mince, Cold cuts (e.g. Ham and turkey breast)	Chorizo, Sausages, Processed meat (check ingredients)
<b>Bread, Cereals, Grains and Pasta</b>	Oats, Quinoa, Gluten free foods (e.g. breads, pasta), Savory biscuits, Buckwheat Chips / crisps (plain), Corn flour, Oatmeal (1/2 cup max), Popcorn, Pretzels, Rice (e.g. Basmati, brown, white), Tortilla chips	Barley, Bran, Cous cous, Gnocchi, Granola, Muesli, Muffins, Rye, Semolina, Spelt, Wheat foods (e.g. Bread, cereal, pasta)
<b>Nuts and seeds</b>	Almonds (max of 15), Chestnuts, Chia seeds, Hazelnuts, Macadamia nuts, Peanuts, Pecans (max of 15), Poppy seeds, Pumpkin seeds, Sesame seeds, Sunflower seeds, Walnuts	Cashews, Pistachio
<b>Milk</b>	Almond milk, Coconut milk, Hemp milk, Lactose free milk, Oat milk (30ml max), Soya milk (made with soy protein)	Cow milk, Goat milk, Rice milk, Sheep's milk, Soy milk (made with soy beans)
<b>Dairy</b>	Butter, Dark chocolate, Milk chocolate (3 squares max), White chocolate (3 squares max)	Buttermilk, Cream, Custard, Greek yoghurt, Ice cream, Sour cream, Yoghurt
<b>Cheese</b>	Brie, Camembert, Cheddar, Cottage cheese, Feta, Mozzarella, Parmesan, Swiss	Cream cheese, Ricotta cheese
<b>Condiments</b>	Barbeque sauce, Chutney (1 tbsp max), Garlic infused oil, Golden syrup, Strawberry jam / jelly, Mayonnaise, Mustard, Soy sauce, Tomato sauce	Hummus dip, Jam (mixed berries), Pasta sauce (cream based), Relish, Tzatziki dip
<b>Sweeteners</b>	Aspartame, Acesulfame K, Glucose, Saccharine, Stevia, Sucralose, Sugar / sucrose	Agave, High Fructose Corn Syrup (HFCS), Honey, Inulin, Isomalt, Maltitol, Mannitol, Sorbitol, Xylitol
<b>Drinks</b>	Beer (one max), Coffee, black, Drinking chocolate powder, Herbal tea (weak), Orange juice (125ml max), Peppermint tea, Water Wine (one max)	Coconut water, Apple juice, Pear juice, Mango juice, Sodas with HFCS, Fennel tea, Herbal tea (strong)

## Limitations

The main limitation of low FODMAP diet, when trying to practice in Sri Lanka is unavailability of information on FODMAP content in both naturally occurring foods as well as in packaged food. But ongoing research will provide answers to the above limitation.

## Conclusion

As there is strong evidence to show that low FODMAP diet is effective for symptom control, practicing it even with current limitations might benefit the patients with irritable bowel syndrome. Meanwhile ensuring the adequacy and the quality of macronutrients and micronutrients in their diet is equally important.

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