

Minimal Fructose Diet

Hereditary Fructose Intolerance (HFI) is caused by the reduced activity of the enzyme essential in the metabolism of fructose. Children with HFI need to avoid fructose, sucrose and sorbitol in their diet to avoid developing symptoms.

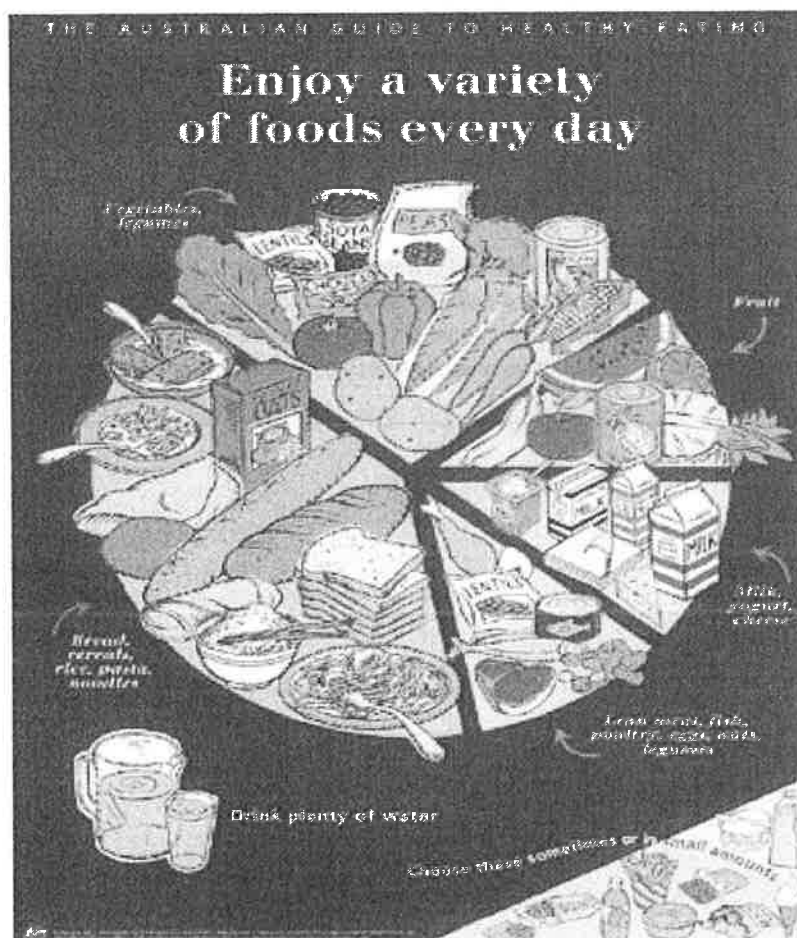
This diet sheet aims for 1-2g fructose a day. Your Doctor will let you know how much fructose you can have each day.

FRUCTOSE is a sugar found naturally in fruits, vegetables and honey. It is also a part of the disaccharide sucrose (or cane sugar). **SUCROSE** is found in fruits, vegetables, and wholegrain cereals and is added to a wide range of canned and processed foods (as a sweetener and preservative). **SORBITOL** is a sugar alcohol commonly used as an artificial sweetener and also needs to be avoided.

Diet Summary

It is important that children have a variety of (**allowed**) foods from each of the five food groups every day:

1. Breads and Cereals:
2. Vegetables and Legumes:
3. Meat and meat alternatives:
4. Milk and milk products:
5. Fats and Oils:



Dietary Fibre

In avoiding fruits and many vegetables, breads and cereals, this diet is low in dietary fibre.

To increase the amount of fibre use allowed wholemeal/wholegrain bread, crackers, cereals, vegetables and pulses (legumes) whenever possible.

Vitamin Supplement

We recommend a daily multivitamin supplement (sucrose, fructose and sorbitol free) as this diet is low in essential vitamins such as Vitamin C and folic acid (eg. Nature's Own multivitamin and mineral). Please discuss this with your pharmacist.

Reading Labels

Care must be taken to avoid commercial food products and medications containing sucrose, fructose and sorbitol. **Labels should be examined carefully** and any of the products containing these ingredients must be avoided.

- | | | |
|---------------------|----------------|---------------|
| • Brown sugar | • Fructose | • Molasses |
| • Castor sugar | • Golden Syrup | • Sorbitol |
| • Cane sugar | • Honey | • Sugar |
| • Corn syrup | • Icing Sugar | • Sucrose |
| • Corn syrup solids | • Inulin | • Treacle |
| • Demerara sugar | • Isomalt | • White Sugar |
| | • Lycasin | |

Flavourings can be another potential trace source of sucrose and fructose as sugars are sometimes used as carriers for flavour compounds.

NB Toothpaste – choose one that does not contain sorbitol (eg Macleans Sensitive ®)

Example:

Can you identify the sources of fructose in this ingredient list?

NUTRITIONAL INFORMATION

Serving per packet = 16

Serving Size = 30g

INGREDIENTS: Cereals (wheat flour, oatmeal, maizeflour), wheat gluten, brown sugar, sugar, malt extract, salt, minerals (calcium carbonate, iron) mineral salt (sodium bicarbonate), natural flavour, vitamins.

General Guidelines

- Always check ingredient lists.

FOOD GROUPING	Foods Allowed	Foods to Avoid
1. Vegetables & fruits	Refer to exchange list	Refer to exchange list
2. Breads, cereals, flour, biscuits & cakes	Refer to exchange list	Refer to exchange list
3. Milk & milk products	<p>Human milk</p> <p>Infant formulas without sucrose eg. Nan®, S26®, Karicare Infant Follow-on®</p> <p>Cow's milk eg. Evaporated milk (unsweetened), low fat, skim milk, buttermilk, milk powder (skim & whole)</p> <p>full fat • Natural unsweetened yoghurt (whole & low fat)</p> <p>Cream, sour cream</p> <p>Coffee creamers</p> <p>Cheese (all) including: Plain cottage cheese Ricotta, cottage, cream cheese</p> <p>Goat milk</p>	<p>Infant formula containing sucrose or corn syrup</p> <p>Soy formula eg. Infasoy®, Isomil® Soy beverages/drinks eg. So good®</p> <p>Flavoured milks and milk shakes</p> <p>Sweetened condensed milk Dessert whip</p> <p>Fruit, flavoured and sweetened yoghurts (eg. vanilla yoghurt) and fromage frais</p> <p>Commercial ice-cream</p> <p>Fruit cheese</p>

FOOD GROUPING

	Foods Allowed	Foods to Avoid
4. Meat & meat alternatives	<p>Meats eg. Beef, pork, lamb Offal eg. kidney & liver</p> <p>Beef & pork sausages (check ingredients)</p> <p>Chicken, Turkey</p> <p>Fish (fresh or canned) & other seafood Eggs</p> <p>^{Beans} Pulses (refer to exchange list)</p> <p>Tinned and frozen products are permitted if the label indicates the ingredients are suitable</p> <p>Chicken Nuggets (Mcdonalds)</p>	<p>Processed meats eg. ham & bacon, sausage meat. Tinned meat Luncheon meats eg. salami, devon, Strasburg & frankfurts.</p> <p>Check ingredient lists of processed chicken/turkey products. Check ingredient lists of processed fish products.</p> <p>Stews and casseroles should be checked for ingredients.</p> <p>Tinned Baked beans T.V.P (textured vegetable protein) Fried bean curd</p>
5. Fats	<p>Margarine, butter, Cream, thickened cream, sour cream Oils Homemade mayonnaise and dressings without sugar</p>	<p>Mayonnaise mustards</p> <p>Commercial dressings & marinades containing sugar</p>
Sugars / Sweeteners	<p>Glucose Glucose syrup Glucose polymers eg. Polyjoule®, Polycose®, Glucodin®, Glucose drinks eg. Lucozade®(original variety). Lactose Galactose Starch Dextrose Maltose, Maltodextrin, malt extracts Dextrins</p> <p>Artificial sweeteners, eg Saccharine, Aspartame and Nutrasweet®</p>	<p>Alcohol Cord Syrup, corn syrup solids Fructose Fruit sugar Hydrogenated glucose syrup Invert sugar Isomalt Laevulose Lycasin Sorbitol Sucrose Sugar (cane or beet) white, brown, raw, icing, castor, Demerara etc) Sweetadin® Golden syrup, maple syrup, Molasses, Treacle, caramel.</p>
Spreads	<p>Vegemite®, cream cheese, cottage cheese.</p> <p>Fresh avocado (<50g) see exchange list Tahini (<10g)</p>	<p>Jams, honey, peanut butter, Nutella®, marmalade, lemon curd, marzipan, Diabetic jams. Soy lecithin (322) Caramel colouring (150) Marmite®</p>

Sugar free

• Cereals – choose 5 serves each day only

A maximum of 5 serves are allowed each day.

Note that some foods are allowed only 1-2 times a week

Serve sizes are in brackets. No serve size specified in foods where fructose content negligible.

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roy free
white
bread.*

Allowed ($< 0.1\text{g}$ fructose/ serve)	Allowed 1-2 times/week ($0.1 - 0.2\text{g}$ fructose/ serve)	Not Allowed ($> 0.2\text{g}$ fructose / serve)
Breads White / brown / wholemeal / mixed grain bread or rolls (1 slice / $\frac{1}{2}$ roll) Fibre increased white bread (1 slice) Crumpets (white/wholemeal) (1) Biscuits & cakes Puffed, toasted crispbread eg. Cruskits® (4 biscuits) Plain/wholemeal crackers eg. Vitaweat ® (6 biscuits) Pancakes (2 medium) Plain scone (home made) 50g Infant teething rusk (1) Icecream cone (1) Pastry – filo/puff/short (unsweetened)	White Lebanese bread (1/4 round) Rye bread (1 slice) Protein increased / milk breads (1 slice) Fibre increased wholemeal bread (1 slice) English muffins (1) Commercial breadcrumbs (30g) Water crackers (8 biscuits) Saos® (2 biscuits) Jatz® (4 biscuits) Ryvita ®(2 biscuits) Pastry – wholemeal (50g)	Wholemeal Lebanese bread Pumpernickel bread Fruit breads/muffins Sweetened breads (eg some burger buns) <i>McDonalds</i> Commercial biscuits other than in allowed lists Cakes, biscuits and pastries unless known to be free of sucrose, fructose & sorbitol Croissant
Breakfast cereals Puffed rice, corn and wheat (eg. from health food shop) (25g) Infant rice cereal (eg. Farex®) (<50g dry weight)	Oats & oat bran ????? Porridge Oats	Breakfast cereals eg. Ricebubbles® Cornflakes®, Weetbix, ®, Weeties®, All- Bran®, Branflakes®, Nutrigrain®, mueslis etc. that contain sugar and / or fruit.
Flours, pasta & grains White flour (wheat) (50g) Rice (white) (1/2 cup) Macaroni, spaghetti Pasta (plain or spinach) (1/2 cup) Semolina (1/2 cup) Arrowroot, cornflour, sago, tapioca, barley	Rice flour (40g) Oats Brown or Sungold rice (1/2 cup) Bulgur (25g) Polenta (30g)	Flour – soy, rye and wholemeal types. Bran – rice, wheat and oat types. Wheat germ Pearl barley

Vegetables – choose 2 serves each day only

1 serve = 50g vegetables

Use only fresh, home cooked or frozen vegetables

* Boil and discard water

Allowed ($< 0.1\text{g}$ fructose/ serve)	Allowed 1-2 times/week ($0.1 - 0.2\text{g}$ fructose/ serve)	Not Allowed ($> 0.2\text{g}$ fructose / serve)
Avocado	Angeled luffa	Artichoke – Jerusalem type
Broccoli	Artichoke – globe type	Asparagus
Bitter melon	Bean – broad, green, snake & purple types	Bean - butter
Cabbage – Chinese & mustard types	Bean sprouts – raw	Beetroot
Chilli - green	Celery	Brussels sprouts
Chives – Chinese	Chicory	Cabbage – common, Savoy, red & white types
Endive	Cucumber – apple type	Capsicum – green & red types
Garl chrysanthemum	Garlic	Carrot
Lettuce – common type	Hairy melon	Cassava
Mushroom	Kidney beans	Cauliflower
Parsley	Lemon	Chives
Potato	Lettuce – Mignonette type	Chilli – banana, long & red types
Potato – hot chipped	Lime	Choko
Plain crisps	Pulses: Red kidney beans	Cucumber – common, telegraph & Lebanese types
Snow pea	Chip peas	Celeriac
Spinach – Chinese, water & English types	Dried split peas	Corn
Watercress	lentils	Eggplant
	Radish - red	Fennel
	Rhubarb	Gherkins
	Silverbeet	Ginger
	Taro	Kohlrabi
	Wax gourd	Leek
	Zucchini – golden type	Lettuce – Cos type
		Marrow
		Okra
		Olive
		Onion
		Pea - green
		Parsnip
		Pumpkin – all types
		Pulses: broad beans and soya
		Radish – Oriental & red type
		Shallots
		Spring onions
		Squash – all types
		Sweet corn
		Sweet potato
		Swede
		Tomato
		Turnip
		Zucchini – green type

References

1. Bell, L. Current practices and improved recommendations for treating hereditary fructose intolerance. JADA. 1987, 6. 721-728.
2. Dept. of Community Services & Health, Canberra. Composition of Foods Australia, 1990.
3. Makinson, J.H.; Greenfield, H. and Wills, R.B.H. Composition of Australian Foods; 44 sweet and savoury biscuits. 1989. Food Australia; 802-807.
4. Makinson, J.H.; Greenfield, H. and Wills, R.B.H. Composition of Australian Foods; 45 cakes & pastries. 1989. Food Australia; 897-902.

Any queries please contact Department Nutrition & Dietetics ph: (02) 9845 2225

MINIMAL FRUCTOSE DIET

FRUCTOSE is a sugar naturally found in fruits, vegetables and honey. It is also a part of SUCROSE which is found in fruit, vegetables, wholegrain cereals and is added to a wide range of canned and processed foods (as a sweetener and preservative).

Check labels carefully

Avoid foods containing:

Sugar	Treacle
Sucrose	Corn syrup
Fructose	Corn syrup solids
Cane sugar	Molasses
White sugar	Honey
Brown sugar	Fruit
Castor sugar	Vegetables
Icing sugar	Wholegrain cereals
Demerara sugar	
Golden syrup	

Very few commercial products can be used in this diet.

A MULTIVITAMIN SUPPLEMENT (sucrose and fructose free) is recommended.

Check with your Dietitian for a suitable brand.

Foods of Animal Origin

Fresh meat, chicken, fish are allowed freely. However, processed meats and dairy products should be checked and avoided if they contain added sugar.

Foods of Vegetable Origin

Cereals, legumes, nuts, seeds, fruits and vegetables contain fructose and sucrose. Moderate amounts of some of these foods are allowed, the rest should be avoided. See the attached lists for details.

MINIMAL FRUCTOSE DIET

FOODS ALLOWED	FOODS NOT ALLOWED
<p><u>MILK GROUP</u> Breast Milk Infant formula (sucrose-free) eg. Nan, S26, Enfalac, Prosobee Cows Milk Evaporated Milk (unsweetened) Plain Yoghurt (natural/unsweetened) Fresh Cream</p>	<p>Portagen Soy drinks & Beverage eg. So Good Infant Soy Formulae, eg. Infasoy, Isomil Flavoured Milk Sweetened Condensed Milk Fruit and Flavoured Yoghurt Dairy Desserts Ice Cream</p>
<p>Cheese Butter</p> <p><u>MEAT GROUP</u> Meat (including brains, liver, kidney) Chicken Fish (fresh, canned in oil or water only) Eggs</p> <p><u>FATS</u> Margarine, oil, butter lard, copha, cream</p> <p><u>SUGARS</u> Glucose (including Polyjoule/Polycose), lactose, glucose drinks eg. Lucozade, Galactose, starch, maltose and dextrose. Artificial sweeteners eg. Saccharine, Aspartame, Nutrasweet Sweeteners</p> <p><u>MISCELLANEOUS</u> Vegemite, Marmite, Promite</p> <p>Soda Water Tea, Coffee</p> <p>The following may be used sparingly if at all:</p> <p>Mustard, Herbs, Spices, Vanilla</p>	<p>Processed Meats Luncheon Meats & Sausages Canned Meats & Fish Frozen Meals with sauces & vegetables Baked Beans, lentils, legumes, nuts & seeds</p> <p>Mayonnaise Commercial dressings & Marinades</p> <p>Fructose Sucrose (table, cane, white, castor, brown, raw, icing sugars) Honey, Golden Syrup Molasses, Treacle, Corn Syrup Sorbital, Sweetadin, Splenda</p> <p>Jams, honey, cocoa, carob Peanut Butter Chocolate, lollies, jelly</p> <p>Drinking chocolate Milo, Ovaltine Activite, Quik, Malted Milk Powder Cordials Softdrinks (including diet drinks)</p> <p>Nuts seeds Dried legumes, beans eg. chickpeas, lentils</p> <p>Stock cubes, tomato sauce/paste, chutney, soy sauce, Bovril/Gravox</p>

CEREALS

Choose up to 5 serves of cereals a day from the following lists.

Serving sizes are in brackets next to each food.

ALLOWED < 0.1g/SERVE

Plain or spinach pasta (1/2 cup)
White rice (1/2 cup)
White/brown/wholemeal bread or rolls (not protein increased) (1 slice or 1/2 roll)
Semolina (1/2 cup)
White flour (50g)
Cruskits (4 biscuits)
Vitaweat (6 biscuits)

ALLOWED 1-2 x WEEK 0.1 - 0.2g/SERVE

Bulgur (25g)
Polenta (30g)
Brown or Sungold rice (1/2 cup)
Riceflour (40g)
Pastry-filo/puff/short (unsweetened) (50g)
White lebanese bread (1/4 round)
Mixed grain bread (1 slice)
Rye bread (1 slice)
Protein increased/milk breads (1 slice)

Crumpets (1 crumpet)
Muffins (English) (1 Muffin)
Water Crackers (8 biscuits)
Puffed Wheat (3/4 cup)
Saos (2 biscuits)
Jatz (4 biscuits)
Ryvita (2 biscuits)
Commercial breadcrumbs (30g)

NOT ALLOWED > 0.2g/SERVE

Pearl barley
Rice bran
Wheat bran
Wholemeal lebanese bread
Fruit Muffin
Oats
Oat Bran

Wheatgerm
Rye flour
Wholemeal flour
Pumpnickel bread
Commercial biscuits other
than in allowed lists

VEGETABLES & FRUIT

Choose 2 serves of vegetables per day only from the following lists:

1 serve - 50g vegetables

Use fresh, home-cooked or frozen vegetables only.

ALLOWED < 0.2g/SERVE

Avocado	Endive	Parsley
Broccoli	Snowpea	Potato
Bitter melon	English spinach	Plain crisps
Chinese cabbage	Globe artichoke	Watercress
Chinese spinach	Green chilli	Water spinach
Chinese chives	Garl chrysanthemum	
Common lettuce	Mustard cabbage	
	Mushroom	

ALLOWED 1-2 x WEEK 0.2-0.5g/SERVE

Angeled lufa	Garlic	Red Cabbage
Apple cucumber	Golden zucchini	Red radish
Asparagus	Hairy melon	Raw bean sprouts
Broad beans	Kidney beans	Silverbeet
Brussel sprouts	Lemon	Snakebeans
Cassava	Lime	Taro
Cauliflower	Minonette lettuce	Telegraph cucumber
Celery	Okra	Wax gourd
Chicory	Purple bean	
Green beans	Rhubarb	

NOT ALLOWED All other fruit and vegetables (including those not listed)

Butterbean	Eggplant	Oriental radish	Tomato
Banana chilli	Fennel	Olive	Turnip
Butternut pumpkin	Green Capsicum	Onion	White cabbage
Beetroot	Ginger	Pumpkin	
Butter squash	Green zucchini	Parsnip	
Common cabbage	Green pea	Qld. pumpkin	
Carrot	Jerusalem artichoke	Red capsicum	
Chives	Kohlrabi	Red chilli	
Choko	Long chilli	Savoy cabbage	
Common cucumber	Leek	Sweet corn	
Cos lettuce	Lebanese cucumber	Sweet potato	
Celeriac	Marrow	Swede	
	Nugget pumpkin		

MULTIVITAMIN SUPPLEMENTS

Choose from one of the following:

Pentavite Chewable

1 tablet daily

Children's Pentavite

< 3 yrs = 2.5ml daily

> 3 yrs = 5ml daily

Polyvisol

0.6ml daily

Ketovite Syrup
and tablet

5ml per day

3 per day

REFERENCES

1. Current practices and improved recommendations for treating hereditary fructose intolerance.
Louise Bell
Jnl. Am. Dietetic Assoc.
June 1987, 6, 721-728
2. Composition of Foods Australia 1990
Dept of Community Services & Health, Canberra
3. Composition of Australian Foods
44 Sweet & Savoury Biscuits
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Food Australia June 1989 pg. 802-807
4. Composition of Australian Foods
45 Cakes and Pastries
J.H. Makinson, H. Greenfield & R.B.H. Wills
Food Australia August 1989 pg. 897-902

Note: In preparing this diet sheet 1 serve of foods is defined as the amount a person would usually eat.