



NAME: Sample Patient

KITID: SAMPLE-0001

DATE TESTED: 1 January 2024

Discover your path to

WELLNESS NUTRITION EXERCISE

INTRODUCTION

YOUR RESULTS

DIET

LIFESTYLE

SUPPORT



Disclaimer and Limitations

The information in this report reflects research to date on the relevance of Copy Number Variation (CNV) in the AMY1 gene. Genetic research is rapidly increasing and our understanding of AMY1 CNV will increase over time, and so the content of future reports may vary from this one.

Research has indicated a correlation between AMY1 copy number variation (represented here as your "CarbChoice number") and the production of salivary amylase and, hence, the ability to break down starchy carbohydrates. This report therefore outlines the potential impact of CarbChoice number on general health and fitness and provides intervention suggestions that may be of assistance. However, there are many influences on your weight management success and sports performance including lifestyle, environmental and additional genetic effects which are not included in this report.

People with special dietary considerations or health conditions, such as allergies or intolerances, women who are pregnant, seeking to become pregnant, breastfeeding or minors, should seek advice from a qualified health practitioner before undertaking this test.



Congratulations on making the choice to improve your health and wellbeing!

Your CarbChoice report is designed to guide you on your journey toward better long-term health and wellbeing. You can use this information to prepare a personalised diet, exercise and wellness plan that supports your individual needs for making the right choices around starch carbohydrates.

What you will learn from your CarbChoice profile

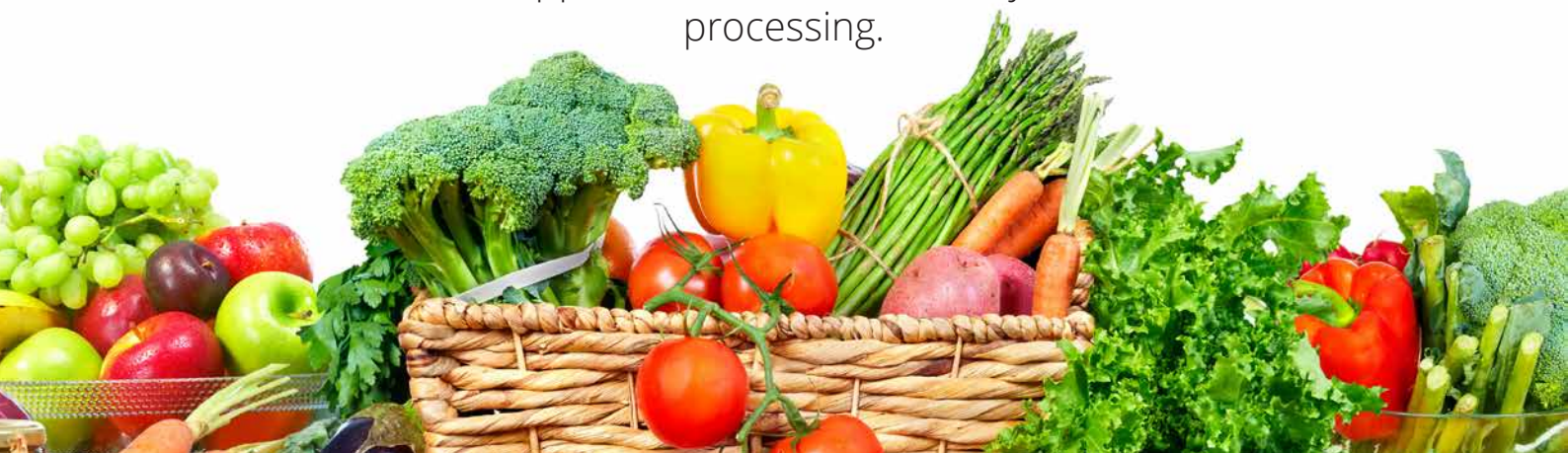
Your potential genetic predisposition to processing starch carbohydrates.

How much starchy carbohydrate might be suitable for you.

Foods and ingredients to include as part of your daily diet supporting optimal starch carbohydrate processing.

Foods to avoid or minimise to support your weight management goals and nutritional needs.

Foods to increase your amylase levels to support better starch carbohydrate processing.



Scientific studies have shown there are variations in the human salivary alpha-amylase gene (AMY1) which may influence how effectively individuals break down and process starchy carbohydrates (Perry et al. 2007) meaning some people may be able to tolerate these carbohydrates better than others.

Over time, the AMY1 gene has evolved in humans to have an increased number of copies. While the average copy number is six, it can range from 1 to over 20. (Marcovecchio et al. 2016).

Research has linked the adaptation to a high-starch diet to this variation, as the additional copies of AMY1 may improve the ability to digest starch carbohydrates (Perry et al. 2007).

There is scientific evidence to support that the types of carbohydrate consumed, how the food is prepared and eaten are all important for weight control and health outcomes. For those with reduced ability to process starch carbohydrates, a selection of appropriate high fibre carbohydrates may be an alternative to a low carbohydrate diet.

Low Carbohydrate diets have been demonstrated to be an effective approach for weight loss; when compared to low-fat diets they have been shown to help with weight loss and to improve the metabolic risk factors associated with diabetes and cardiovascular disease (high triglycerides, low HDL, high blood sugar).

Some individuals feel well on a low carbohydrate diet (low carb, low GI etc.) while others may feel fatigued, moody and have difficulty concentrating.



Your CarbChoice profile reveals whether your starch carbohydrate processing activity falls into one of three ranges:



Low Activity Processing

Individuals who are low processing should decrease their intake of starch carbohydrate and consider changing to higher fibre carbohydrates. High starch carbohydrate intake is associated with a greater risk of obesity, insulin resistance and diabetes.



Moderate Activity Processing

Individuals with moderate processing ability can tolerate more starch carbohydrate such as grains. High starch carbohydrate intake is associated with a higher risk of weight management issues and related problems.



Higher Activity Processing

Individuals with high range processing ability can tolerate a higher level of starch carbohydrate intake, such as grains which has less impact on weight management and insulin levels.

They have a lower risk of obesity.

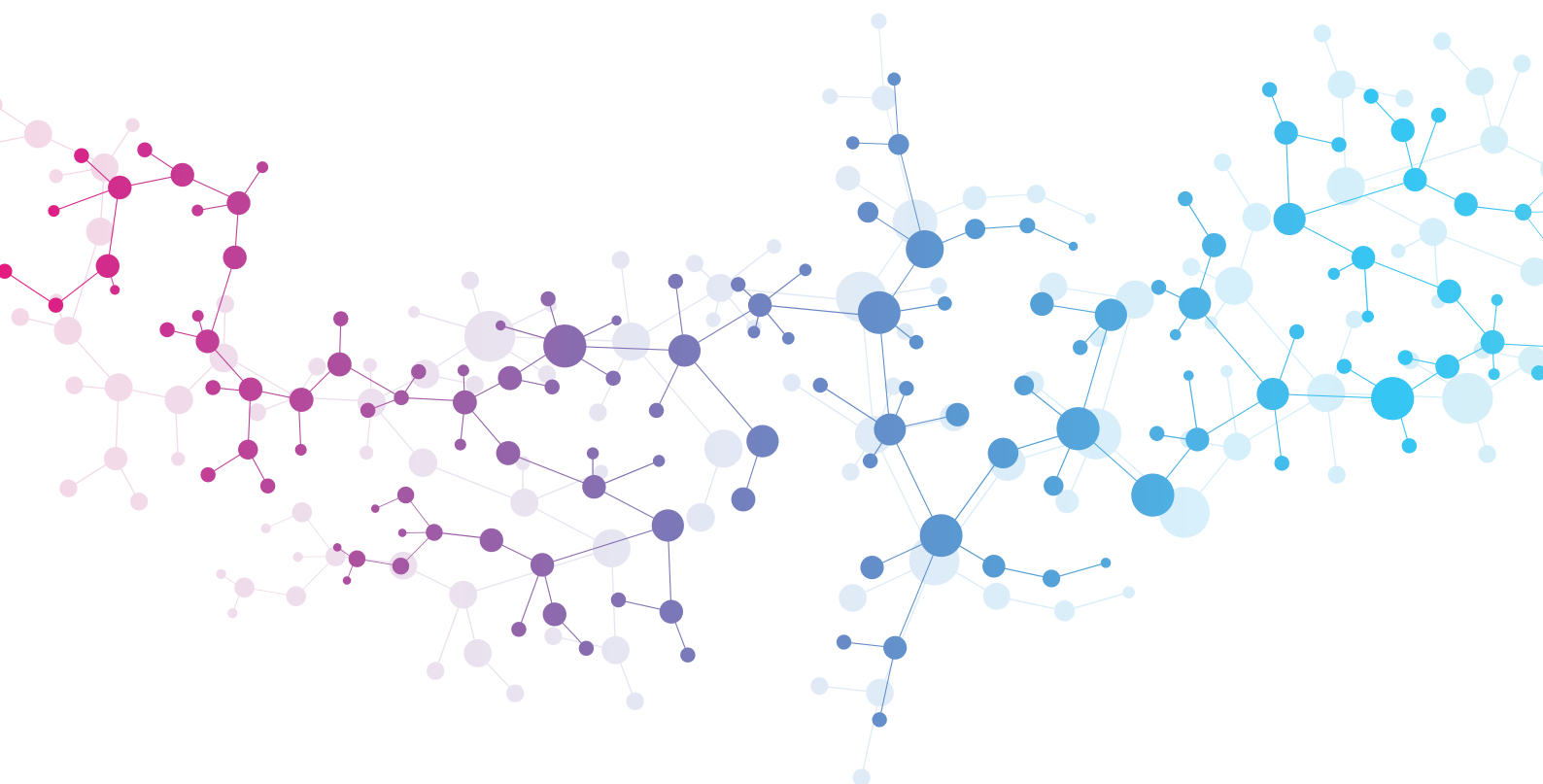


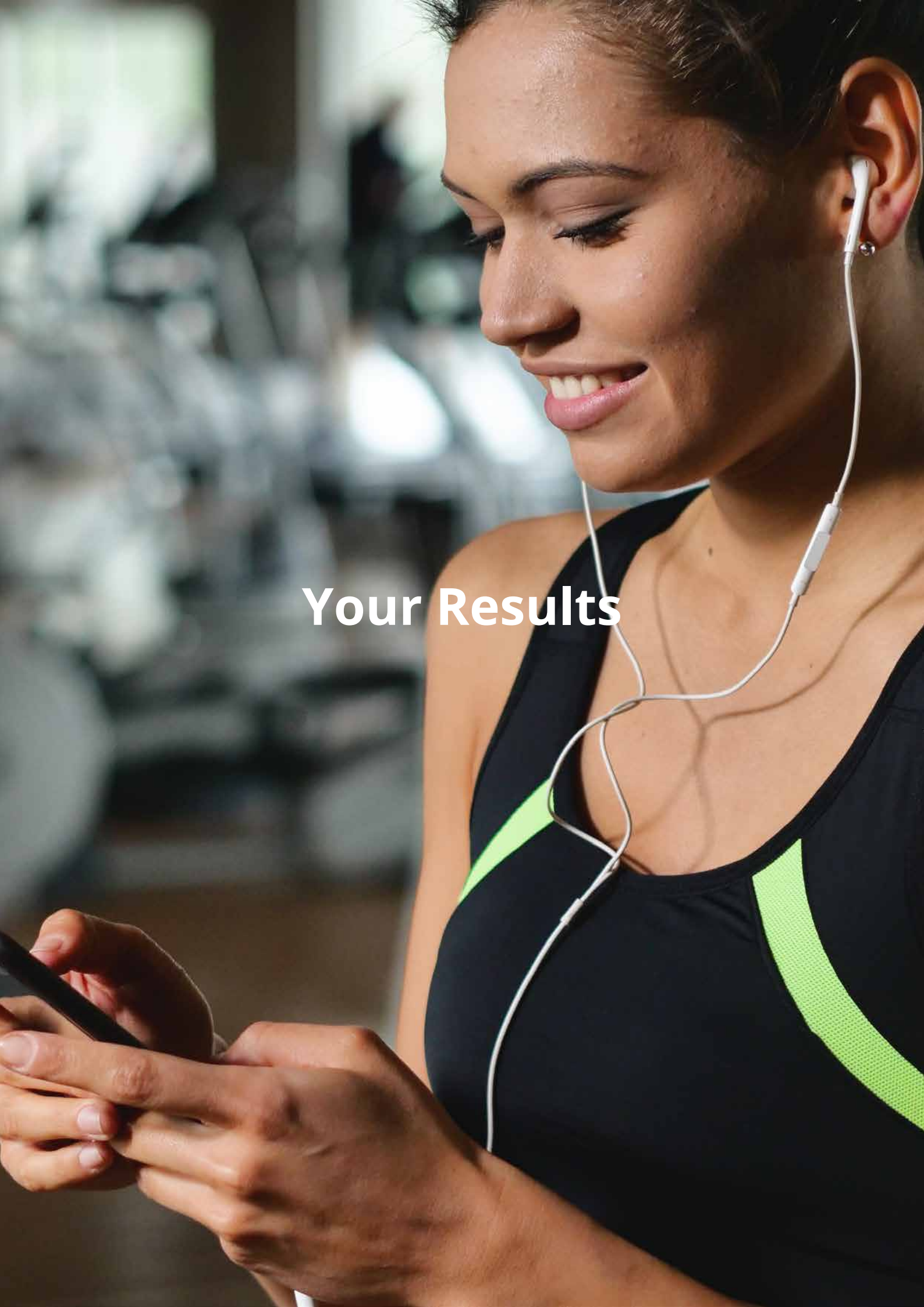
What will my CarbChoice result tell me?

Your DNA sample has been analysed to determine a Copy Number Variation for your amylase gene. This analysis calculates how many copies of the amylase gene you have and will be your CarbChoice score which is unique to you.

Your CarbChoice score is an indication of how well you process carbohydrate starch and can provide insight into important dietary, nutrition and lifestyle interventions to assist you in managing your health and achieving your nutritional goals.

While you can't change your genes, you can change how your body responds. Certain foods may be less optimal for you and should be avoided or eaten sparingly. There are steps you can take in your diet and exercise to increase your production of amylase and improve your carbohydrate starch processing. Your CarbChoice report outlines these potential interventions for you.



A close-up, profile shot of a young woman with dark hair tied back, smiling as she looks down at a smartphone held in her hands. She is wearing white wired earbuds and a black athletic tank top with bright green diagonal stripes. The background is a blurred gym setting with various exercise machines.

Your Results

Sample Patient: Here is your CarbChoice result indicating that you are a Moderate Range Starch Carbohydrate processor.



Classified in this CarbChoice report as the population group most likely to have moderate capacity to process starchy carbohydrates.

Your moderate processing capacity means:

- You may not produce as much of the enzyme in your saliva needed to break down the starch found in carbohydrates.
- You may have moderate tolerance of high-starch diets.
- You may be at a moderate risk of, and predisposition to, obesity.
- You may have reduced glycaemic control resulting in decreased glucose or blood sugar control.
- You may have an moderate risk of metabolic abnormalities which occur when the normal process of metabolism is or becomes disrupted.
- You may be at moderate risk of obesity compared to individuals with a higher processing result.
- You may be at slightly higher risk of insulin resistance and diabetes if you are consuming a high starch carbohydrate diet.

Dietary Recommendations

Your moderate starch carbohydrate processing capacity means you should aim to reduce refined and processed starchy carbohydrates in your everyday diet.

Trial a low carbohydrate diet providing 25-40% of overall daily energy intake (approx. 125 - 200g for women) made up of low starch options.

Lifestyle Recommendations

You should undertake moderate to high-intensity physical activity. Before starting this type of exercise, you should discuss this with your fitness or health practitioner, especially if pregnant, breastfeeding, suffering from any medical condition or injury.

1. Replace high starch foods in your diet with no or low starch foods (see your report for details) or resistant starch wholefoods.
2. Consume foods or drinks that increase amylase production before any high starch meals, i.e. citric acid drinks, acidic fruits (see report for details).
3. Consume higher starch meals towards the end of the day or after 30 minutes of moderate to high-intensity exercise.
4. Avoid smoking and drinking tea or alcohol before meals.
5. Fill up on vegetables from the no starch and low starch lists (see report for details) to assist with weight loss.
6. Use the table of suggested food swaps to help start making appropriate food choices for your AMY1 CNV result.

Your moderate AMY1 CNV means you can tolerate moderate starch foods, however it is important to still only consume these in small portions.

Portion Control – An Important Factor in Your Diet

It's essential to understand serving sizes when it comes to the amount of food you eat and the calories and energy it contains. Success in weight management depends upon eating the right amount of foods based on what your body needs.

Do a portion check on your meals aiming for:



Cooked Carbohydrate/Starch
1/2 of your palm



Coloured Vegetables or Salad
2 x your palm



Lean meat/Chicken/Fish
Size of your palm and the thickness of little finger

Three Key Ways to Achieve Your Goals

1. Reduce or actively manage your food choices and quantities.
2. Improve your amylase production.
3. Recognise that lifestyle factors such as exercise can contribute to good health and weight management.

Research has shown that different foods can either increase or decrease amylase production either assisting or hindering the breakdown of starch carbohydrates.

Increasing Amylase

Foods containing citric acid have been shown to increase your production of amylase which helps break down starch carbohydrates.

Foods containing Citric Acid g/100g



SUNDRIED
TOMATOES
5.4g/100



LEMON
4.5g/100



LIMES
4.3g/100



PASSIOFRUIT
PULP
3.5g/100



RASPBERRIES
2.4g/100



TAMARILLO
1.8g/100



POMEGRANTE
SEEDS
1.7g/100



TOMATO PASTE
salted
1.6g/100



APRICOTS
1.4g/100



GUAVA
1.4g/100



TANGELO
1.4g/100



MANDARIN
1.3g/100



GRAPEFRUIT
1.2g/100



RASPBERRIES
CANNED
1.1g/100



Amylase Inhibitors

Whilst salivary amylase can be increased, there are several plants which contain polyphenols which may inhibit or decrease salivary amylase and, hence, affect your carbohydrate metabolism.

These include foods and beverages such as:

Foods and beverages inhibiting Amylase



STRAWBERRIES



BLUEBERRIES



BLACKCURRANTS



PUMPKIN



BEANS



CORN



EGG PLANT



RED CABBAGE



BLACK TEA



RED WINE

**Berries are best consumed with no or low starch food.*



Starch is an important factor in your choice of carbohydrates. The following is a summary that will assist you with your food choices. There is a difference between starch and resistant starch as outlined below.

Foods with no or limited Starch



A moderate starch processing range means you should choose, where possible no or low starchy carbohydrate foods. These should make up a significant portion of your dietary choices.

Your goal should be to have a balanced, nutrient-dense diet, low in starchy carbohydrates meeting your energy goals.

Your profile includes a range of suggested no and low starch foods to get you started.

Resistance starch foods



Resistant starches resist digestion in the small intestine. They contribute to the fibre in your diet and will help maintain your gut microbiome.

Your profile includes a list of resistant starch foods to assist with managing your particular dietary needs and help you feel full and satisfied.

Green bananas are one of the best sources of resistant starch.

High starch foods



With a moderate AMY1 CNV, foods and ingredients from the high starch section should be limited where possible.

When you do eat them, minimise their impact by:

- Eating them after you've consumed the protein and non-starchy vegetable portions of your meal.
- Leave the skins on.
- Eat wholegrain versions.

Breakfast



2 x sourdough toast +
peanut butter



1/3 cup raw oats + strawberries
and low fat milk



Lunch



Stir fry Asian noodle



1 piece Rye with, spinach,
cucumber, tomato, feta
and a tin of salmon (90grams)



Dinner



2 cups cooked rice



1 cup sweet potato cooked with
skin on and steamed vegetables
with skin on wherever possible



A full-body photograph of a woman with dark hair in a ponytail, wearing a white sports bra and grey sweatpants, performing a pull-up on two wooden gymnastic rings. She is in a gym setting with large windows in the background, blue exercise balls, and a kettlebell on the floor. The text "Lifestyle factors" is overlaid in the center of the image.

Lifestyle factors

You have a moderate range AMY1 CNV; there are lifestyle choices which can maintain or increase your levels. The following offers some guidance.

Salivary amylase is influenced by lifestyle factors such as:

- **Exercise and sport.**
- **Chewing your food.**
- **Satiety**
- **Food perception**
- **Conditions in which you eat your food.**

Exercise



Can actually increase the activity of amylase by up to 500%. Consider the following to support your processing capacity:

- Undertake exercise that exerts you at least moderately before eating starchy foods.
- Amylase activity and concentration may be increased for up to two and a half hours afterwards depending on the intensity of the exercise.
- As Amylase production increases with exercise intensity, research indicates that interval training on a stationary bike (fast or vigorous pedalling interspersed with low intensity rest periods) may be more effective than using a treadmill.

Chew your food

Moderate range processor of starch carbohydrate may also have altered perception of the taste of food specifically its sweetness and texture. Foods may not taste as sweet and creamy as a high range processor resulting in adding more sugar or textural elements such as cream to the cooking process.

Chewing your food for longer will improve your starch carbohydrate digestion, helping to control your appetite, and helping to increase satiety and improve your insulin response. Here are some useful eating tips.

- Chew each mouthful for 25 to 30 seconds to slow down your rate of eating.
- Practice mindful eating.
- Avoid eating in front of the TV or while doing other activities.
- Take a deep breath before eating.
- Smell and savour each bite.
- Put your fork down between bites or eat with your non-dominant hand.

Alcoholic Drinks

Alcohol decreases the activity of amylase in your saliva. It is recommended that you avoid alcohol before meals especially when eating high starch carbohydrate meals, for best results.

Few alcoholic beverages contain starch. Those that do are Mirin (5g/100g) and pear cider/perry (2g/100g); bitters and cream-based liqueurs can also contain less than a 1g/100g of starch.

The overall energy content of alcoholic beverages can be high due to the energy in the alcohol with a standard drink contains approximately 300 kilojoules of energy.

Additional energy comes from carbohydrates present in liqueurs, port and sherry, mixed spirits, apple and pear ciders and cocktails.

Smoking

Smoking decreases the level and activity of amylase. Increased oxidative stress has also been shown to decrease amylase.

- Stop smoking or avoid smoking before high starch meals.

Hydration

The normal turnover of water, excluding perspiration, is approximately 4% of total body mass. In a 70 kg adult this is equivalent to 2.5 - 3.0 litres per day.

Solid food can contribute on average approximately 20% of the total water intake or about 0.7 to 0.8 litres per day.

Dehydration of as little as 2% loss of body weight can result in impaired physiological responses and performance.



Supporting your CarbChoice Lifestyle

The next section of your CarbChoice profile outlines:

- Foods with no or small amounts of starch.
- High starch foods are included to assist with your understanding of what you should avoid where possible and to assist with dietary planning.
- Lifestyle factors that influence starch carbohydrate processing.
- Sample meal plan.
- Sample exercise sessions to increase salivary amylase.



Fruit

Enjoy lots of these no starch foods as part of your meal planning. This is just a sample selection to get started.



While fruits in the following list do not contain any starch carbohydrates, they do contain sugars which may contribute to weight gain. Adding sugar as part of the cooking process will also increase the energy content significantly. AUSNZ dietary guidelines (which can be found at www.eatforhealth.com.au) recommend two serves of fruit a day and define a standard serve as being about 150g (350kj).

For example, consider:

- 1 medium apple, orange or pear;
- 2 small apricots, kiwifruit, or plums or;
- 1 cup of fresh berries or no added sugar canned fruit

All count as a single serve.

Fruits - No Starch



APRICOT



BLACKBERRY



CHERRY



CRANBERRY



FIG



GOJI



GRAPES



GRAPFRUIT



KIWI FRUIT



LEMON



LIME



LOQUAT



LYCHEE



MANDARIN



MELONS



MULBERRY



NECTARINE



ORANGE



PASSIONFRUIT



PAPAYA



PEACH



PEAR



PERSIMMON



PINEAPPLE



PLUM



POMEGRANATE



QUINCE



RAMBUTAN



RASPBERRY



RHUBARB



ROCKMELON



STARFRUIT



TAMARIND



TAMARILLO



TANGERINE



WATERMELON

Vegetables



AUSNZ dietary guidelines recommend 5 serves of vegetables a day and define a standard serve as being about 75g (100-350kj).

For example:

- 1/2 cup of cooked broccoli
- 1 cup of green leafy or raw salad vegetables
- 1 large carrot or 1 medium tomato.

Enjoy any of these NO starch vegetable foods



ALFALFA



ASPARAGUS



AVOCADO



BEETROOT



BOK CHOY



CHOI SUM



BROCCOLI



BRUSSELS SPROUT



CABBAGES



CAPSICUM



CARROT



CAULIFLOWER



CELERIAC



CELERY



CHILLI



CHIVES



CUCUMBER



EGGPLANT



FENNEL



KALE



KOHLRABI



LEEK



LETTUCE



MUSHROOM



OKRA



ONION



PARSLEY



ROCKET



RADDISH



SHALLOT



SILVERBEET



SOYA BEANS



SPINACH



SPINACH BABY



TOMATO



ZUCCHINI

Protein



Serve sizes are based on AUSNZ dietary guidelines - 90grams or a deck of cards.

Enjoy any of these NO starch protein foods



POULTRY



MEAT



EGGS



SEAFOOD

Condiments



Enjoy any of these NO starch items



COCONUT WATER



LINSEED



FLAXSEED



SUNFLOWER SEEDS



HONEY



BUTTER & MARGARINE



OILS AND VINEGAR



HERBS & SPICES

Not all starches are created equal. Resistant starch is a type of starch which isn't fully digested and absorbed; instead, it is converted into short-chain fatty acids by intestinal bacteria, which is good for gut health. The following table highlights some of the foods high in resistant starch.

Foods high in Resistant Starch



GREEN BANANAS
150g = 12.75g RS



BARLEY
230g = 1.84g RS



CHICKPEAS
80g = 1.66g RS



RYE BREAD
60g = 0.81g RS



Low starch foods can be included in your diet to support a well-balanced meal plan. As a guide, these low starch foods are included as starch in grams per 100g (0.3-5g starch per 100 grams)

Fruit



APPLE - UNRIPE
0.5-1g/100g



BLUEBERRY
0.5g/100g



COCONUT FLESH
0.4g/100g



DRIED FRUIT
1.0-1.9g/100g



HAIRY MELON
0.3g/100g



JACKFRUIT
0.4g/100g



MANGO
0.5g/100g



NASHI PEAR
0.5g/100g

Vegetables



BROCCOLINI
0.7g/100g



BUTTER BEANS
0.3g/100g



ENDIVE
0.1g/100g



GREEN PEAS
4.1g/100g



SQUASH
0.3g/100g



SWEDE
0.3g/100g

Other LOW Starch Foods



ALMOND MEAL
1.2g/100g



BRAZIL NUTS
0.3g/100g



FRESH GINGER
3.8g/100g



GALANGAL
3.8g/100g



MIXED NUTS
4.7g/100g



PEANUTS
3.8g/100g



PECAN NUTS
0.6g/100g



PUMPKIN SEEDS
1.5g/100g



TOFU
0.7g/100g



WALNUTS
0.3g/100g

The following is a range of high starch fruits and vegetables that can occasionally be included in your meal planning, however, we recommend being mindful of their impact.

Eating whole grains rather than processed starches is important because of the “wholeness”, i.e. the intact structure of the grain. This reduces the body's glycaemic response and increases the impact of the higher resistant starch content on the gut microbiome.

Fruits



RIPE BANANAS
5.83g/100g



FIGS
5.07g/100g



PRUNES
2.7g/100g



SAPODILLA
2.7g/100g



Vegetables



POTATOES

Especially dry mash mixes, frozen and take-away chips and wedges, hash browns and potato gems



CASSAVA

Especially white cassava which makes tapioca flour, high in starch.



TARO

Taro has been reported to have 70–80% starch with small granules. Because of the small sizes of its starch granules, taro is highly digestible



SWEET POTATOES

Especially frozen chips and white fleshed varieties. Orange flesh varieties have less starch



SWEET CORN

Processed sweet corn (either tinned or frozen) is higher in starch than fresh corn on the cob



PARSNIPS

Root vegetables also tend to have a higher starch content compared to other vegetables. For example, 7 of the 13 grams of carbohydrates found in 1 cup of parsnips are starches



Following is a selection of grains and cereals that are high in starch.

Grains and Cereals



CORN

Including corn starches, popcorn, corn cakes, corn chips, and maize flours used to make corn bread, tortillas and tacos



PASTA

Almost all pasta is made from durum wheat, which is rich in carbohydrates, including starch



TAPIOCA

Tapioca is a starch extracted from cassava root, a tuber native to South America



BREAKFAST CEREALS

Cereals typically contain starches in the form of rice, grains, dried fruit and sugar and other sweeteners.



RICE

Particularly Jasmine rice which has a higher glycaemic response than Basmati rice, rice crackers, rice cakes, rice flour.



WHEAT

Wheat is the major component of flour, bread, biscuits, and cakes.

Other HIGH Starch Ingredients



MUESLI & GRANOLA BARS

Watch out for maize starch and modified starches used as fillers and additives



MILK SUBSTITUTES

Rice milk, oat milk and soy milk



BEVERAGE POWDERS

These include instant chai tea powder, granulated instant coffee, malted milk and strawberry milk powders, coffee substitute powder, cocoa powder



DRIED INGREDIENTS

Dried gravy powders, dried casserole mixes, dried coatings/batters



DEXTRIN & MALTODEXTRIN

These are artificially produced white powder that can be enzymatically derived from any starch, most commonly made from corn, rice, potato starch or wheat



MODIFIED STARCH

Modified Starches (with INS numbers in the 1400-1450 range) used to thicken, stabilise and emulsify foods.

These can be found in products such as thickened cream, pre-prepared custards, dessert mousses and frozen foods.



Research shows that to reduce your glycaemic response to starch, the following cooking methods are recommended; this is important for high starch foods (Lovegrove et al. 2017). Enjoy consuming raw foods where possible or choose steamed or stir fried where cooking is required



Food Preparation Methods



RAW STEAMED STIR FRY



These Food Preparation Methods



BOILING BAKING FRYING MICROWAVING



It's worth noting that the resistant starch content of potatoes and rice is increased when they are cooked and cooled before eating.



Sample Meal Plan



Improve carbohydrate digestion. The following meal plan is indicative only and should be subject to your personal goals.

BREAKFAST

Egg on toast with grilled tomato, spinach

Berry Icy Smoothie bowl



Berry Icy Smoothie bowl

Recipe

Blend gently 1 cup of frozen banana, berries, 5-6 ice cubes
Stir through ½ cup Greek yoghurt and drizzle with maple syrup or honey
Sprinkle with flaked almonds and coconut flakes

SNACKS

Veggie Juice

Banana Smoothie



Banana Smoothie

Ingredients

½ cup oats
1 cup plant based milk of choice (Almond, Soy, Coconut)
Banana
3 ice cubes
Dash of nutmeg or cinnamon, agave, maple or honey

Blend until combined

LUNCH

Salmon dill patties topped with yoghurt and crunchy mango salsa



Ingredients

1 small potato, small tin salmon 2tbs chopped dill ½ cup plain yoghurt
1 egg, 1 mango, 1 tomato
1 small cucumber
1 tsp sesame seeds
Lime juice, Olive oil

Recipe

Grate potato and add to bowl with salmon, ½ dill, and egg. Mix well.
Roll into patties.

Heat oil in pan and cook patties.

Dice mango, tomato and cucumber and combine with sesame seeds set aside until patties have cooked
Ingredients

DINNERS

Baked potato with three bean chilli, guacamole and salad



Ingredients

1 medium sized potato/ white or sweet
1 tin three bean mix
1 x Avocado
Squeeze of lime
2 Tsp chilli
Olive oil
1 cup of Green salad mix, tomato

Recipe

Bake potato in moderate oven for 45 minutes or until soft in middle
Mix bean mix with half chilli. Set aside.
Mash avocado, add lime, chilli and a dash of olive oil.

A close-up, low-angle shot of a person's legs and hands on a rowing machine. The person is wearing bright red leggings with a textured, ribbed pattern on the thighs and knees. Their hands are gripping the blue handles of the machine. The background is a blurred gym environment with warm, golden light. The word "Exercise" is centered in white text over the person's legs.

Exercise

As a moderate range processor exercise is still important to increase salivary amylase up to five times but is directly dependent on the intensity.

To do so exercise must be performed at greater than 70% VO_2 Max. VO_2 Max is the measurement of the maximum amount of oxygen that an individual can utilise during intense, or maximal exercise (Koibuchi 2014).

Research has shown that cycling at this intensity for a minimum of 20-30 minutes will increase salivary amylase, here are some more examples.



10mins warm up at moderate intensity + (20mins at 70% VO_2 Max or 82% heart rate max cycling) + 10mins warm down.

5mins warm up at moderate intensity + (25mins at 70% VO_2 Max or 82% heart rate max running) + 5mins warm down.

30mins at 70% VO_2 Max or 82% heart rate max

5mins warm up at moderate intensity + (10 x 45sec treadmill sprints at 70% VO_2 Max or 82% heart rate max with 15sec rest) + 5mins warm down.

5mins warm up at moderate intensity + (20 x 30sec sprint squats with 1 min rest between efforts) + 5mins warm down.

10mins warm up at moderate intensity + 10 x (1min FAST at 75% VO_2 Max or 86% heart rate max with 1min rest) + 5mins warm down.



It is important to build up to these types of workouts and ensure you have had the appropriate pre exercise screening

High-intensity interval training can also have similar effects. The key exercise parameter is intensity.



While research has used only treadmill and cycles as the exercise modality, there is no doubt that other types of cardio both indoors and outdoors will also increase salivary amylase.



CYCLING



SWIMMING



RUNNING



ROWING



SKIPPING



EELLIPTICAL

Exercise Intensity

VO₂Max or maximal oxygen uptake is a measure of the amount of oxygen your body can utilise in 1 minute. The fitter you are the higher your VO₂max is.

Calculating VO₂ Max can be done either by performing a test exercise session or calculated the using the following formula.

Using your resting heart rate and age:

VO₂ Max = 15.3 x (MHR/RHR)

MHR = Maximum heart rate (beats/minute) calculated using age = 208 - (0.7 x age)

RHR = Resting heart rate (beats/minute) = number of heart beats in 20 seconds x 3

Or by simply using the corresponding percentage of max heart rate. 70% VO₂max equals a heart equivalent to 82% of your maximal heart rate.

The easiest way to calculate HRmax is 220 – your age, however, this may underestimate your correct max heart rate.

If you haven't exercised in the past six months or are taking prescription medication, it is advisable to seek medical advice before commencing any exercise program especially one which involves higher intensity levels.

What's the difference between starch and carbohydrate?

Carbohydrate is a broad term indicating dietary compounds made up of units of simple or small sugar molecules. Carbohydrates are not inherently bad and can provide much-needed energy to make the body function, but different types of carbohydrate have different properties.

Some carbohydrate types include simpler sugars, such as sucrose (table sugar), are easily digested and absorbed compared to dietary fibre which is a complex carbohydrate not readily digested. Fibre-rich foods can have health benefits, and most dietary advice recommends their consumption whereas consumption of simple processed sugars should be limited or eliminated.

Starch is a type of carbohydrate made of long chains of simple sugars. The sugars are released when starchy carbohydrate food is eaten and processed by your body.

Scientific studies have shown that variations in the human salivary amylase gene (AMY1) differ based on populations which have traditionally eaten high starch diets, compared to those who have traditionally eaten low starch diets (Perry et al. 2007). Copy number variations within the AMY1 gene impact salivary amylase activity (Yang et al. 2015; Santos et al. 2012), which influences how well the body breaks down and processes starch. Copy number variations and amylase activity can also impact the oral perception of starch leading to nutritional differences (Mandel et al. 2010).

Simply, some people can process starchy carbohydrates better than others and this can impact their nutrition, dietary choices and health.

Amylase activity, and the ability to process starch, has been demonstrated to have impact on Body Mass Index (BMI) (Bonfond et al. 2017) and hence AMY1 copy number can impact on the related issues of BMI, obesity and weight management (Falchi et al. 2014; Mejía-Benítez et al. 2015; Viljakainen et al., 2015; Marcovecchio et al. 2016). Low amylase individuals may even be at greater risk of insulin resistance and diabetes if they maintain a high starch diet (Mandel and Breslin 2012).



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