Seafood and your health

CESSH
CENTRE OF EXCELLENCE
SCIENCE SEAFOOD HEALTH

DIABETES
Evidence shows that eating a balanced diet high in seafood will reduce your risk of some chronic conditions, or help you manage your symptoms.

This booklet will help guide your food choices and includes a 14-day meal planner specifically designed for people who are at high risk, or who have diabetes that is related to diet (commonly called Type 2).
How can seafood help with diabetes?

A healthy diet can help you manage your weight and may help prevent type 2 diabetes. If you already have diabetes, a healthy diet can help you manage your condition. Diabetes may also increase your risk of other chronic conditions such as heart disease.

Selecting seafood is also a smart choice for lowering cholesterol, and the omega-3 fatty acids in oily fish can actually help to prevent coronary heart disease. In addition to omega-3s, seafood contains many other nutrients beneficial to health, including selenium, iodine, zinc, calcium and vitamin D.

It's also low in saturated fat, high in protein, and a good source of energy.

<table>
<thead>
<tr>
<th>Iron</th>
<th>Iron is important for maintaining energy levels and a strong immune system. Mussels, oysters and tinned sardines are good sources of iron.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>Iodine is important for growth and seafood is the best natural source of iodine. Oysters, mussels and scallops are good sources of iodine.</td>
</tr>
<tr>
<td>Folate</td>
<td>Folate aids the prevention of neural tube defects in growing babies. Oysters and mussels are sources of folate.</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>Vitamin B12 helps the brain to work normally. Sardines, mussels and tuna are good sources of vitamin B12.</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>Vitamin D is good for the immune system and strong bones and muscles. Australian salmon, Atlantic salmon and tuna are good sources of vitamin D.</td>
</tr>
<tr>
<td>Vitamins A and E</td>
<td>Vitamins A and E are powerful antioxidants which help the immune system and eye health. Mussels are the richest seafood source of vitamin A. Atlantic salmon and sardines are good sources of vitamin E.</td>
</tr>
<tr>
<td>Calcium</td>
<td>Calcium is important for maintaining healthy teeth and bones. Australian salmon and sardines are rich sources of calcium.</td>
</tr>
</tbody>
</table>

How much seafood do I need to stay healthy?

Evidence suggests that we should aim to consume 600mg of omega-3s per day for men, and 500mg for women.

Some types of seafood contain higher levels of omega-3s than others so the number of serves of seafood you need to eat each week to maintain good health depends on the type of seafood you eat. Generally, one serve of seafood is around 150g.
How much omega-3?

Adults should aim to include 3500 - 4000mg of omega-3s in their diet each week. This table shows you how much omega-3 is in a 150g serve of a variety of fish and seafood:

<table>
<thead>
<tr>
<th></th>
<th>Omega-3 (mg)</th>
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</thead>
<tbody>
<tr>
<td>Sardine - canned in oil</td>
<td>3766mg</td>
</tr>
<tr>
<td>Australian salmon - canned</td>
<td>3684mg</td>
</tr>
<tr>
<td>Atlantic salmon</td>
<td>3472mg</td>
</tr>
<tr>
<td>Farmed rainbow trout</td>
<td>2941mg</td>
</tr>
<tr>
<td>Sardine - canned in sauce</td>
<td>1323mg</td>
</tr>
<tr>
<td>Bream</td>
<td>1271mg</td>
</tr>
<tr>
<td>Oyster</td>
<td>1085mg</td>
</tr>
<tr>
<td>Mussel</td>
<td>1077mg</td>
</tr>
<tr>
<td>Mullet</td>
<td>1040mg</td>
</tr>
<tr>
<td>Squid / calamari</td>
<td>876mg</td>
</tr>
<tr>
<td>Smoked salmon</td>
<td>769mg</td>
</tr>
<tr>
<td>Tuna</td>
<td>631mg</td>
</tr>
<tr>
<td>Snapper</td>
<td>628mg</td>
</tr>
<tr>
<td>Flathead</td>
<td>619mg</td>
</tr>
<tr>
<td>Barramundi</td>
<td>414mg</td>
</tr>
<tr>
<td>Prawn</td>
<td>330mg</td>
</tr>
<tr>
<td>Lobster</td>
<td>267mg</td>
</tr>
<tr>
<td>Basa</td>
<td>115mg</td>
</tr>
</tbody>
</table>

For example, you may choose to eat 150g of sardines a week to get your omega-3s. Or you may choose to eat 150g of Atlantic salmon and 150g of prawns in a week. Mix it up so you don’t get bored!
## Which fish to choose?

Examples of seafood that are excellent, very good, or good sources of omega-3s.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent sources of omega-3s</td>
<td>Very good sources of omega-3s</td>
<td>Good sources of omega-3s</td>
</tr>
<tr>
<td>Atlantic salmon</td>
<td>Bream</td>
<td>Barramundi</td>
</tr>
<tr>
<td>Trout</td>
<td>Mussels</td>
<td>Snapper</td>
</tr>
<tr>
<td>Sardines</td>
<td>Oysters</td>
<td>Smoked salmon</td>
</tr>
<tr>
<td>Canned salmon</td>
<td>Mullet</td>
<td>Canned tuna</td>
</tr>
</tbody>
</table>
14-day meal planner

This 14-day meal planner has been developed with a dietitian for people at high risk of developing diabetes or who already have diabetes that is related to diet.

Menu suggestion: week one
(Choose one item for each meal)

Breakfast
Cereal and reduced fat milk
Poached eggs on toast
Egg white omelette with smoked salmon

Lunch
Tuna bean salad
Canned salmon salad
Tuna Caesar wraps
Tuna and green bean sushi rolls

Dinner
Grilled tuna steak with parmesan potatoes and vegetables
Grilled trout with BBQ vegetables
Simple fish in green curry
Garlic prawn skewers

Dessert
Fruit (2 pieces)
Low fat yoghurt (200ml tub)
Small bowl of low fat ice-cream
A handful of nuts
Menu suggestion: week two
(Choose one item for each meal)

Breakfast
Cereal and reduced fat milk
Sardines on toast
Boiled eggs and tomato slices on toast

Lunch
Tuna and salad roll
Potato salad
Coleslaw and bean salad
Caesar salad (no dressing)
Smoked salmon sushi rolls

Dinner
Baked barra fillets with chunky mushroom,
tomato and basil sauce
Steamed bream with honeyed vegetables
Curried fish in foil with julienne vegetables
Salmon pasta with fresh garden salad

Dessert
Fruit (2 pieces)
Small bowl of low fat custard
Low fat yoghurt (200ml tub)
A handful of nuts
Grilled tuna steak with parmesan potatoes and vegetables
(Serves 4)

Ingredients:
- 4 tuna steaks (150g each)
- Extra virgin olive oil, for brushing and to serve
- 2 tsp lemon juice
- Lemon wedges to serve
- Salt and pepper
- 750g potatoes, unpeeled
- 25g butter
- 1 bunch spring onions, trimmed and thinly sliced
- 40g fresh parmesan cheese, shaved
- 1 bunch spring onions, trimmed and thinly sliced
- 25g butter
- 4 tbsp fresh basil, finely shredded
- 3 tbsp olive oil
- 4 florets of broccoli
- 2 large carrots, sliced julienne
- 16 green beans

Method:
1. Put the potatoes into a pan of salted water, bring to the boil and cook for 15 minutes until tender. Drain. When cool enough to handle, peel, return to the pan and crush against the sides with a fork until they burst. Cover to keep warm.
2. Melt the butter in a small pan, add the onions and cook gently for 3-4 minutes. Stir into the potatoes with the parmesan, basil, olive oil and seasoning. Cover and keep warm.
3. Place vegetables in a steamer.
4. Brush the tuna with oil and season, then put on a smoking hot griddle, skinned-side down, and cook over a high heat for 2 minutes, pressing gently with a palette knife until it takes on golden bar marks. Sprinkle with lemon juice, cook for a few seconds, then turn and cook for 30 seconds. Turn off the heat and leave on the grill for 30 seconds. The tuna should be slightly rare inside.
5. Spoon the potatoes onto 4 warm plates, steamed vegetables on the side and rest the fish on top. Drizzle with a little oil, sprinkle with pepper and sea salt and serve with lemon wedges.
Recipes

Grilled trout with BBQ vegetables
(Serves 2)

Ingredients:
2 trout fillets (150g each) 
1 tbsp olive oil 
Juice of ½ lemon 
½ large red onion, cut into 4 wedges 
2 flat mushrooms, sliced thick 
1 baby eggplant, halved lengthways 
1 baby zucchini, halved lengthways 
½ red capsicum, seeded and halved 
1 yellow squash, halved 
1 firm ripe tomato, halved 
Olive or canola oil spray

Method:
1. Combine oil and juice in a small bowl. Brush vegetables with the mixture. Heat barbecue and lightly spray with oil.
2. Barbecue vegetables until tender (about 10 minutes depending on thickness), turning after 5 minutes.
3. Once the vegetables have been turned, grill the trout fillets on the barbecue for about 2 minutes each side or until cooked through (thicker fish pieces may need a little extra time).

Salmon pasta with fresh garden salad
(Serves 2)

Ingredients:
2 salmon fillets (150g each), cut into cubes 
Extra virgin olive oil 
1 small onion, diced 
1 x 400g tin of diced tomatoes 
¾ to 1 cup of chicken stock 
2 cups of pasta (any sort) 
1 packet of soup (French onion/pea and ham)

Method:
1. Add oil to frypan and cook onion until soft. Add salmon and cook.
2. Add packet of soup and the tin of tomatoes. Stir. Add stock until sauce reaches desired consistency and simmer for about 10 minutes or until fish is cooked.
3. While the sauce is simmering, cook pasta.
4. Serve with a fresh green garden salad.

*For a variation, leave out the stock and serve the sauce over rice.
**Recipes**

**Baked barra fillets with chunky mushroom, tomato and basil sauce**  
*(Serves 4)*

**Ingredients:**
- 4 barramundi fillets (150g each)
- 1 to 2 tbsp butter, melted
- 1 lime, juiced
- 4 tbsp olive oil
- 2cm to 3cm ginger, grated
- 4 cloves of garlic, crushed
- 1 tbsp coriander, chopped
- 2 fresh truss tomatoes, finely chopped
- ½ brown onion, chopped
- 1 cup button mushrooms, finely chopped
- ½ cup basil, finely chopped
- Salt and pepper, to taste
- Fettuccine

**Method:**
1. Combine melted butter, lime juice and olive oil in a large bowl and stir together. Add grated ginger, crushed garlic, coriander, tomatoes, onion, mushrooms, basil, salt and pepper. Stir thoroughly. The result should be a thick combination, but still contain plenty of juice.
2. Pour half of the marinade into a shallow baking dish, and place the fish fillets on top. Place the rest of the marinade over the top of the fish so it is completely covered. Cover with aluminium foil, and refrigerate for 2 hours.
3. Preheat the oven, and cook fish for 20 minutes at 180°C, covered with aluminium foil (or until fish is cooked through).
4. Meanwhile, cook pasta to al dente and serve fish on top of pasta.

*As an alternative to pasta, serve on a bed of rice.*

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**Tuna and bean salad**  
*(Serves 2)*

**Ingredients:**
- 1 small tin tuna
- 1 small tin 4 bean mix
- 5 cherry tomatoes, quartered
- ¼ red capsicum, diced
- ¼ red onion, diced
- Low fat mayonnaise

**Method:**
Drain tuna and beans. Combine in a bowl and mix through diced vegetables. Add low-fat mayonnaise to taste.
Simple fish in green curry
(Serves 4)

Ingredients:
- 500g bream, chopped into bite-sized pieces
- 1 tbsp olive oil
- 2 tsp curry paste, either homemade or store bought
- 400ml can lite coconut milk
- ½ red capsicum, sliced finely
- ½ green capsicum, sliced finely
- 1 bunch bok choy, washed and cut in four

Bean sprouts to garnish
Cooked jasmine rice to serve

Fresh curry paste:
- Ginger (4cm piece)
- 2 cloves garlic
- 3 green chillies
- 1 bunch fresh coriander, including the root, finely chopped
- 1 tsp salt
- 1 tbsp fish sauce
- 2 tbsp palm sugar

Method:
1. To make the curry paste, use a mortar and pestle to grind the ginger, garlic, and chilli to a paste. If you don’t like it too hot, just use two chillies and remove the seeds before adding to the mortar and pestle.
2. Add a few coriander roots (only use the main part and remove the finer hairy roots).
3. Add coriander leaves. Add salt (it will help with grinding the ingredients).
4. Once in paste form, add the fish sauce and palm sugar and mix through.
5. Heat a large wok on the stove and add olive oil. When hot, add curry paste (about 2 large teaspoons). Reduce to a simmer and add coconut milk, then the capsicum, and simmer for a few minutes. Add the fish pieces and cook over low heat for a few minutes until fish is nearly cooked. Add the bok choy and simmer for a further 2 minutes or until bok choy has wilted.
6. Serve over steamed jasmine rice and garnish with bean sprouts.
For more information on seafood and health please visit www.cessh.curtin.edu.au

For more information on diabetes visit:

Diabetes Australia
www.diabetesaustralia.com.au

Diabetes WA
www.diabeteswa.com.au