



Transform Your Diabetes



Secret Strategy For

**Helping You to Prevent Early Morning
High Blood Glucose Levels**

Waking with high blood glucose levels is awful

Waking up with a high blood glucose level is awful, it seems to set the scene for the whole day. Many of us with diabetes struggle with insulin resistance in the morning and this can make eating breakfast and dosing with the right amount of insulin a real challenge. Researchers suggest that this challenge is caused by a group of hormones called catecholamines that our bodies release in the pre-dawn hours; this is a normal and natural event that happens in people with and without diabetes.



What are catecholamines?

They are a group of hormones that also function as neurotransmitters, in other words they excite our nervous system. The main hormones in this class are dopamine, adrenaline (also known as epinephrine) and noradrenaline (also known as norepinephrine).

What do they do?

Each of the hormones has a different job, for example dopamine is associated with pleasure, adrenaline (epinephrine) gives us the flight of fight response and noradrenaline (norepinephrine) increases alertness and focuses attention.

Why are they released early in the morning?

The catecholamines are released into our bodies in the predawn hours and they give our brain a nudge that it is time to wake up and become more alert. This is normal, natural and it is a good thing. One of the ways in which they function is to make us resistant to insulin, it is thought that even in people without diabetes experience a slight rise in blood glucose levels that is important in waking us up. Some researchers think that this 'moderate' insulin resistance early in the morning excites the part of the brain that wakes us up (the reticular arousal system). For people with diabetes this process is thought to be an important contributor to the dawn phenomenon, causing high blood glucose levels and high insulin needs first thing in the morning. As the action of the catecholamines wear off we typically become more sensitive to insulin in the mid to late morning. This might explain why some people that use insulin to manage their diabetes need large doses of insulin at breakfast and then they experience low blood glucose by lunch time.

What can I do about it?

Your health care team can help you to adjust your insulin levels to meet your needs, but ***you can also use a simple trick with your evening meal that may offer a benefit to your post breakfast blood glucose levels.*** Eat your beans (think lentils, kidney beans, black beans, Lima beans, Pinto beans etc) as part of your evening meal. They may help to reduce your blood glucose spike at dinner and at breakfast, it is called ***the second meal effect.***

Really?

Yes, really, here is the science. Lentils and chickpeas etc have a really low glycemic index and this helps to prevent blood glucose levels climbing to very high levels after a meal. The most amazing part is that it takes a long time to digest lentils and beans, so just about the time you are waking up in the morning a fermentation process is

Transform Your Diabetes



happening in your gut that produces a special chemical called propionate. *Propionate seems to create the second meal* effect by relaxing the gut and this slows down the rate at which food leaves your stomach allowing time for your morning insulin resistance to wear off a bit and for your own insulin (injected or otherwise) to function and it seems to reduce the amount that your blood glucose rises after breakfast.

Do baked beans give you the second meal effect?

Baked beans don't seem to have quite the same effect, for me at least, and I think this is because the sauce they are in is high in sugar, but in the spirit of your diabetes may vary, give it a try they might work for you. In general (even tinned) lentils and beans that are prepared at home by you may be better.



What about oats and breads?

The milling and cooking processes for oats and bread seem to reduce or even remove this blood glucose mitigating effect, although in one study double the volume of rye kernels in bread and was able to demonstrate some benefit. However, for most bread purchased in a store/bakery it seems unlikely that this will work.

Could this help in other types of diabetes?

The effect has been tested in people without diabetes, and anecdotally here at 1bloodydrop we have seen this working on people with pre-diabetes, type 2 diabetes & type 1 diabetes. One study even suggests that substituting the protein source on your plate for lentils or beans in just one meal per day was associated with a 35% reduction in the risk of developing pre-diabetes!

When will I see the effects?



TIME LENTILS/BEANS EATEN

Breakfast

Lunch

Dinner

POST MEAL BLOOD GLUCOSE MODERATION TYPICALLY SEEN AT

Breakfast, Lunch & Dinner

Lunch & Dinner

Dinner & Breakfast

Check your blood glucose levels

If you start adding lentils and/or beans to your meals you might need to monitor your blood glucose levels a little more carefully because you may find that you need less insulin than normal at the meal you eat them at and the meal afterwards!

Can I use other strategies too?

Yes, taking some exercise before breakfast, and your fast acting morning insulin, can be really beneficial, check the exercise videos on 1bloodydrop.com to learn more about this. You should also discuss your insulin requirements with your health care professionals if you need any advice. Combining pre-breakfast exercise and with a meal containing beans or lentils at dinner the night before can be very effective.

Transform Your Diabetes



Summary

Eat your beans.

- Eating lentils/beans/legumes helps to moderate blood glucose levels at:
 - The meal they are consumed, due to lower glycemic index (& high fibre)
 - The second meal after you have eaten them due to the effects of propionate

Exercise

- Exercising first thing in the morning before breakfast, and before your fast acting insulin, can be very effective at lowering blood glucose levels and reversing insulin resistance too. The morning insulin resistance can even help to protect you from hypos for short duration of activity.
 - In this sense exercise could include anything from walking the dog to going for a jog or even cleaning the bathroom, but anaerobic exercises like weight lifting or sprinting might cause your blood glucose to go up

Eat Your Beans & Exercise

- Eating your beans and exercising before breakfast might have even more powerful effects on your morning insulin resistance.

Speak to Your Health Care Team

- If you need help in adjusting your medications, including insulin, speak to your health care professionals.
- If you have additional dietary needs ask your dietician for some guidance.

References:

Brighenti F, Benini L, Del Rio D, Casiraghi C, Pellegrini N, Scazzina F, Jenkins DJ, Vantini I. Colonic fermentation of indigestible carbohydrates contributes to the second-meal effect. *Am J Clin Nutr*. 2006 Apr;83(4):817-22. doi: 10.1093/ajcn/83.4.817. PMID: 16600933.

Jenkins DJ, Wolever TM, Taylor RH, Barker HM, Fielden H. Exceptionally low blood glucose response to dried beans: comparison with other carbohydrate foods. *Br Med J*. 1980 Aug 30;281(6240):578-80. doi: 10.1136/bmj.281.6240.578. PMID: 7427377; PMCID: PMC1713902.

Jenkins DJ, Wolever TM, Taylor RH, Griffiths C, Krzeminska K, Lawrie JA, Bennett CM, Goff DV, Sarson DL, Bloom SR. Slow release dietary carbohydrate improves second meal tolerance. *Am J Clin Nutr*. 1982 Jun;35(6):1339-46. doi: 10.1093/ajcn/35.6.1339. PMID: 6282105

Mollard RC, Wong CL, Luhovyy BL, Anderson GH. First and second meal effects of pulses on blood glucose, appetite, and food intake at a later meal. *Appl Physiol Nutr Metab*. 2011 Oct;36(5):634-42. doi: 10.1139/h11-071. Epub 2011 Sep 29. PMID: 21957874..

You confirm that you have agreed to the Disclaimer and Legal Liability Waiver.

This publication is for entertainment & educational purposes only. It is NOT intended to diagnose or treat medical conditions. Within the context of this document Paul Coker & 1bloodydrop.com are serving as educators - not as your medical provider. Always consult your doctor in a timely manner for any medical concerns. Never change or discontinue any doctor prescribed medical treatment without consulting your doctor first. This document is NOT to be taken as substitute for individual medical advice. You hereby forever release, waive and discharge any claims against Paul Coker, 1bloodydrop.com & associates. You confirm that you're using this product solely for your personal entertainment or education and take full responsibility for your own action & results.

Transform Your Diabetes

