



# 5 Studies on The Paleo Diet – Does it Actually Work?

By [Kris Gunnars, BSc](#) | July, 2015 | 256,199 views

In the year 2013, the paleo diet was the world's most popular diet.

However, it is still very controversial among health professionals and mainstream nutrition organizations.

Some have embraced the diet as healthy and reasonable, while others think it is downright harmful.

Fortunately... science can give us some answers here, because 5 human studies have been done on the paleo diet so far.

In this article, I take an objective look at each of these studies and their conclusions, then I summarize the findings at the end.



## A Quick Primer on The Paleo Diet

The **paleo diet** emulates the diet of our hunter-gatherer ancestors, based on the premise that they did not suffer from the same diseases as modern humans.

This diet advocates consumption of unprocessed animals and plants, including meat, fish, **eggs**, vegetables, fruits, nuts and seeds.

It shuns processed foods, **sugar**, dairy and grains, although some of the more modern “versions” of paleo do allow foods like dairy and rice.

## The Studies

All of these studies are done in humans and are published in respected, peer-reviewed scientific journals.

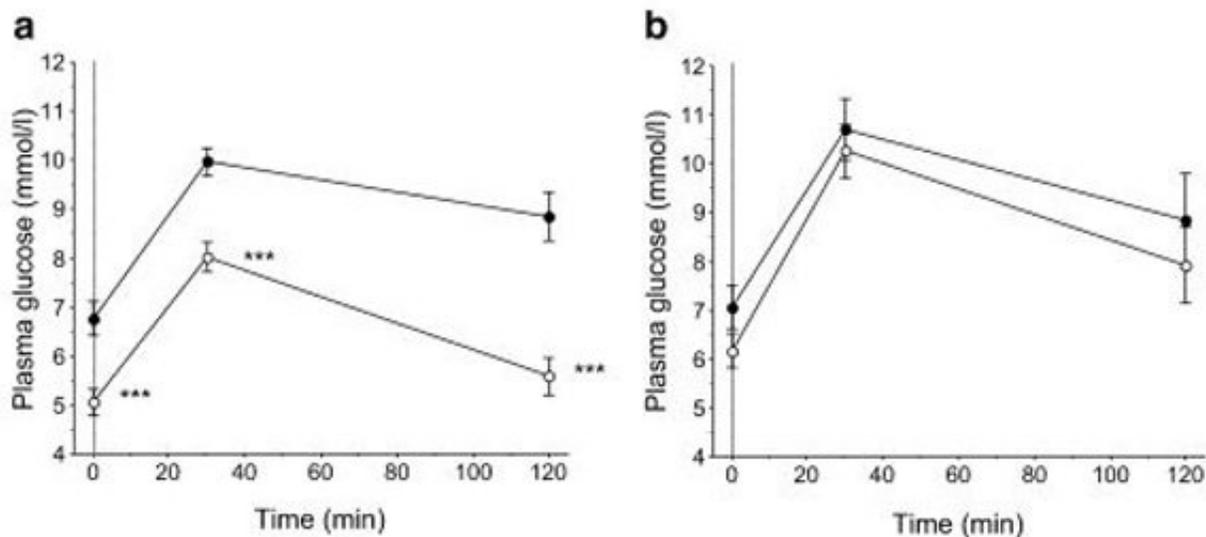
### 1. Lindeberg S, et al. **A Palaeolithic diet improves glucose tolerance more than a Mediterranean-like diet in individuals with ischaemic heart disease.** *Diabetologia*, 2007.

**Details:** 29 men with heart disease and elevated blood sugars or type 2 diabetes, were randomized to either a paleolithic diet (n=14) or a Mediterranean-like diet (n=15). Neither group was calorie restricted.

The main outcomes measured were glucose tolerance, insulin levels, weight and waist circumference. This study went on for 12 weeks.

**Glucose Tolerance:** The **glucose tolerance test** measures how quickly glucose is cleared from the blood. It is a marker for insulin resistance and diabetes.

This graph shows the difference between groups. The solid dots are the baseline, the open dots are after 12 weeks on the diet. Paleo group is on the left, control group on the right.



As you can clearly see from the graphs, only the paleo diet group saw a significant improvement in glucose tolerance.

**Weight Loss:** Both groups lost a significant amount of weight, 5 kg (11 lbs) in the paleo group

and 3.8 kg (8.4 lbs) in the control group. However, the difference was not statistically significant between groups.

The paleo diet group had a 5.6 cm (2.2 inches) reduction in waist circumference, compared to 2.9 cm (1.1 inches) in the control group. The difference was statistically significant.

#### **A few important points:**

- The 2-hour Area Under the Curve (AUC) for blood glucose went down by 36% in the paleo group, compared to 7% in the control group.
- Every patient in the paleo group ended up having normal blood sugars, compared to 7 of 15 patients in the control group.
- The paleo group ended up eating 451 fewer calories per day (1344 compared to 1795) without intentionally restricting calories or portions.

**Conclusion:** A paleolithic diet lead to greater improvements in waist circumference and glycemic control, compared to a Mediterranean-like diet.

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### **2. Osterdahl M, et al. [Effects of a short-term intervention with a paleolithic diet in healthy volunteers](#). *European Journal of Clinical Nutrition*, 2008.**

**Details:** 14 healthy medical students (5 male, 9 female) were instructed to eat a paleolithic diet for 3 weeks. There was no control group.

**Weight Loss:** Weight decreased by 2.3 kg (5 lbs), body mass index decreased by 0.8 and waist circumference went down by 1.5 cm (0.6 inches).

**Other Markers:** Systolic blood pressure went down by 3 mmHg.

**Conclusion:** The individuals lost weight and had a mild reduction in waist circumference and systolic blood pressure.

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### **3. Jonsson T, et al. [Beneficial effects of a Paleolithic diet on cardiovascular risk factors in type 2 diabetes: a randomized cross-over pilot study](#). *Cardiovascular Diabetology*, 2009.**

**Details:** 13 individuals with type 2 diabetes were placed on either a paleolithic diet or a typical Diabetes diet in a cross-over study. They were on each diet for 3 months at a time.

**Weight Loss:** On the paleo diet, the participants lost 3 kg (6.6 lbs) more weight and lost 4 cm (1.6 inches) more off of their waistlines, compared to the Diabetes diet.

#### **Other Markers:**

- **HbA1c** (a marker for 3-month blood sugar levels) decreased by 0,4% more on the paleo diet.
- **HDL** increased by 3 mg/dL (0.08 mmol/L) on the paleo diet compared to the Diabetes diet.
- **Triglycerides** went down by 35 mg/dL (0.4 mmol/L) on the paleo diet compared to the Diabetes diet.

**Conclusion:** The paleo diet caused more weight loss and several improvements in cardiovascular risk factors, compared to a Diabetes diet.

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**4. Frassetto, et al. Metabolic and physiologic improvements from consuming a paleolithic, hunter-gatherer type diet. European Journal of Clinical Nutrition, 2009.**

**Details:** 9 healthy individuals consumed a paleolithic diet for 10 days. Calories were controlled to ensure that they wouldn't lose weight. There was no control group.

**Health Effects:**

- **Total Cholesterol** went down by 16%.
  - **LDL Cholesterol** went down by 22%.
  - **Triglycerides** went down by 35%.
  - **Insulin AUC** went down by 39%.
  - **Diastolic Blood Pressure** went down by 3.4 mmHg.
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**5. Ryberg, et al. A Palaeolithic-type diet causes strong tissue-specific effects on ectopic fat deposition in obese postmenopausal women. Journal of Internal Medicine, 2013.**

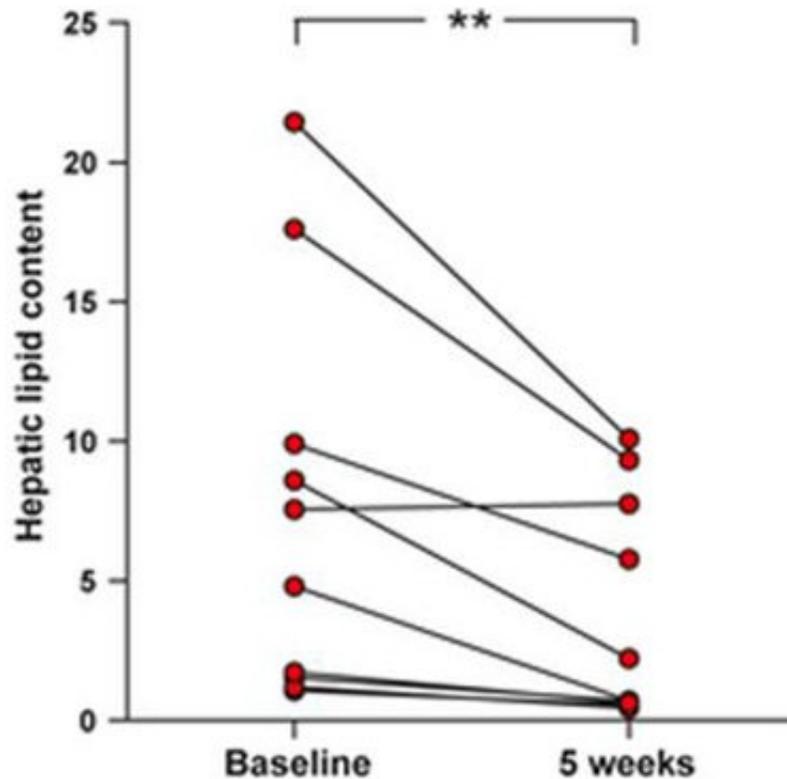
**Details:** 10 healthy women with a BMI over 27 consumed a modified paleolithic diet for 5 weeks. There was no control group.

Main outcomes measured were liver fat, muscle cell fat and insulin sensitivity.

**Weight Loss:** The women lost an average of 4.5 kg (9.9 lbs) and had an 8 cm (3.1 inches) reduction in waist circumference.

**Liver and Muscle Fat:** The fat content of liver and muscle cells are a risk factor for metabolic disease. In this study, the women had an average reduction in liver fat of 49%, but no significant effect on the fat content of muscle cells.

This graph shows how the fat content in liver cells decreased:



As you can see, the women who had a lot of liver fat (fatty liver) had the most significant decrease.

#### Other Health Effects:

- **Blood pressure** went down from an average of 125/82 mmHg to 115/75 mmHg, although it was only statistically significant for diastolic blood pressure (the lower number).
- **Fasting blood sugars** decreased by 6.35 mg/dL (0.35 mmol/L) and **fasting insulin levels** decreased by 19%.
- **Total cholesterol** decreased by 33 mg/dL (0.85 mmol/L).
- **Triglycerides** went down by 35 mg/dL (0.39 mmol/L).
- **LDL cholesterol** went down by 25 mg/dL (0.65 mmol/L).
- **HDL cholesterol** decreased by 7 mg/dL (0.18 mmol/L).
- **ApoB** decreased by 129 mg/L (14.3%).

**Conclusion:** During the 5 week trial, the women lost weight and had major reductions in liver fat. They also had improvements in several important health markers.

## Studies That Were Not Included

I skipped the following two studies because they weren't applicable:

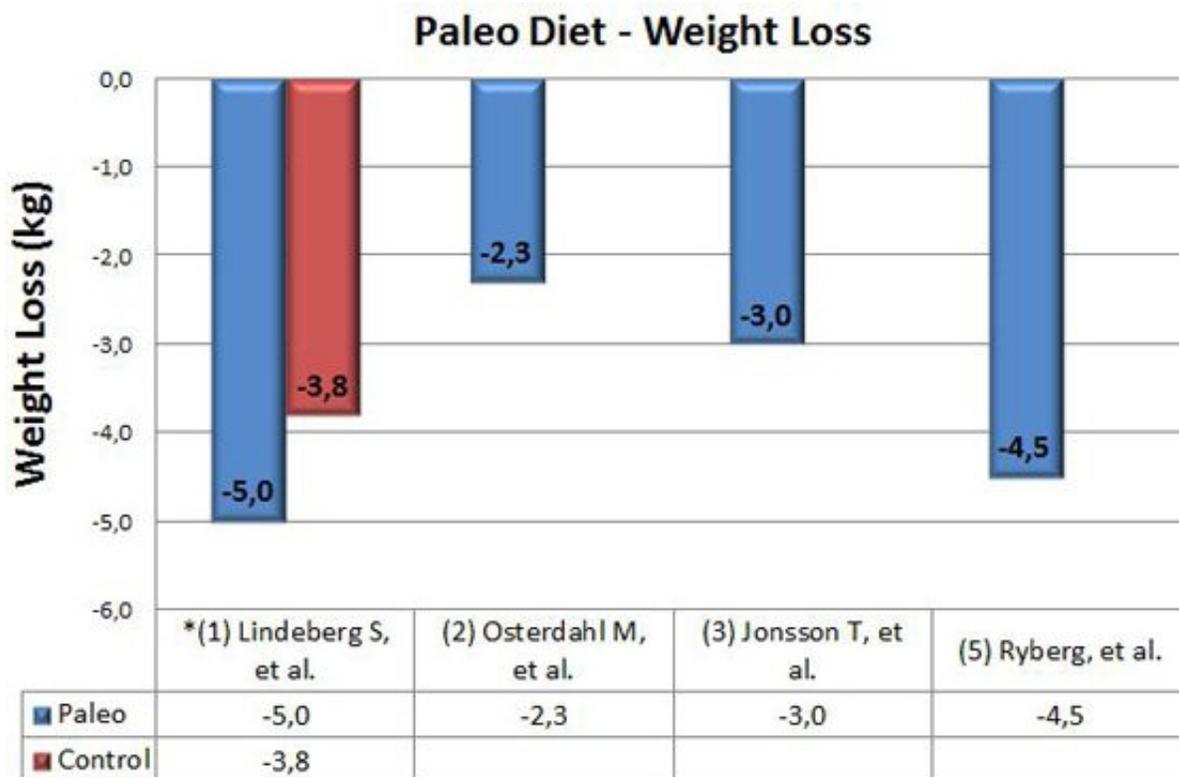
[Jonsson T, et al. 2006](#) – This is a randomized controlled trial, but it is done in pigs, not humans.

O'Dea K. 1984 – In this study, 10 diabetics lived as hunter-gatherers for 7 weeks and had incredible improvements in health. Very interesting study, but there are too many confounders to conclude anything about the diet itself.

So, only **human** studies that isolate **diet** as the sole variable are included in the analysis.

## Weight Loss and Waist Circumference

This graph shows the amount of **weight loss** in the studies.



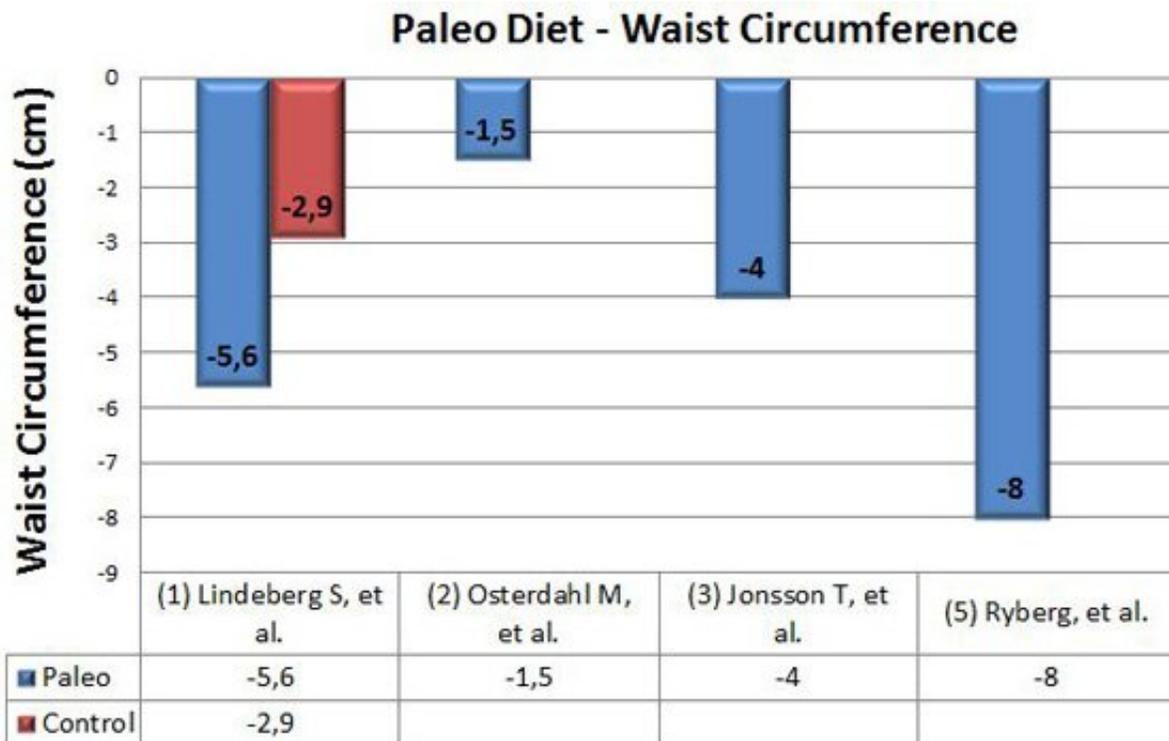
\* In Lindeberg, et al (1), the weight loss difference was not statistically significant.

I did not include Frassetto, et al (4) because they controlled for calories to make sure that the participants didn't lose weight.

There are several things worth mentioning here:

- None of the participants were instructed to restrict **calories**, but they spontaneously reduced calorie intake by 300-900 calories per day.
- The participants ended up eating much fewer **carbs** and more protein, compared to what they were eating before.

The graph below shows the effect on waist circumference (a marker for the harmful visceral fat around the organs).

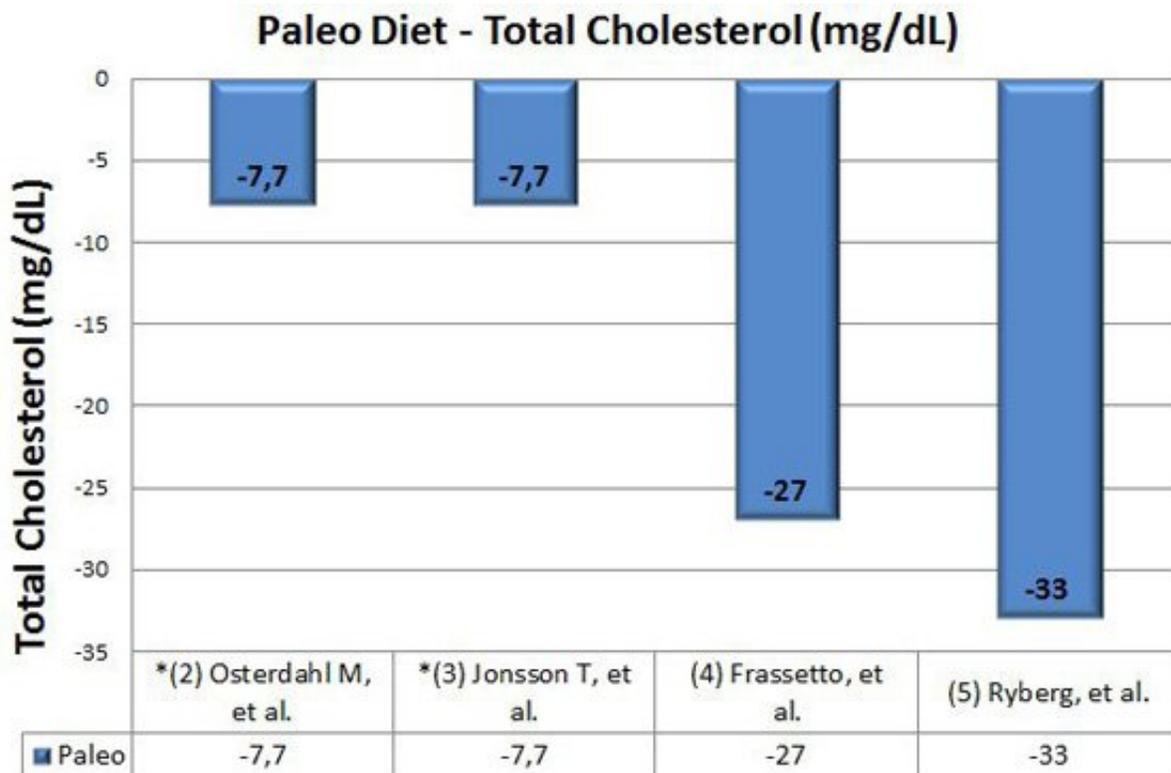


The studies had statistically significant reductions in waist circumference, which should translate to a reduced risk of diseases like diabetes and cardiovascular disease.

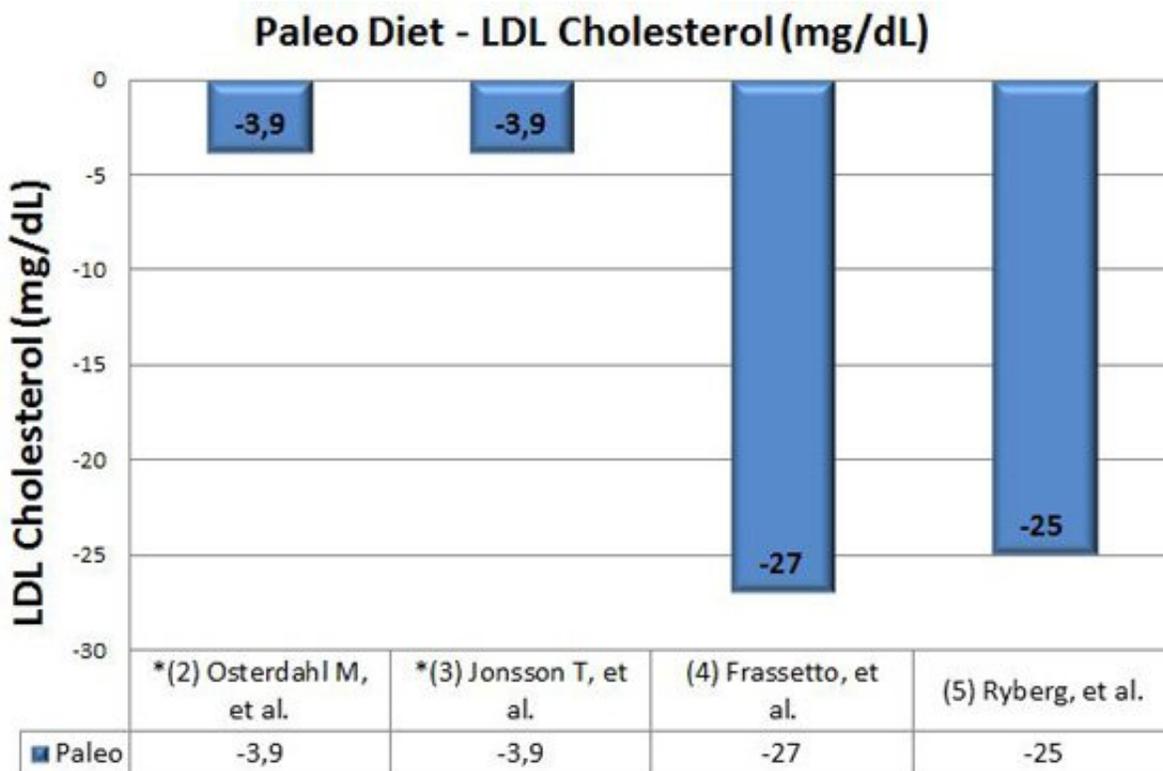
It is worth mentioning again that Ryberg, et al (5) had an average reduction in liver fat of 47% after 5 weeks on the paleo diet, which is very impressive.

## Cholesterol and Triglycerides

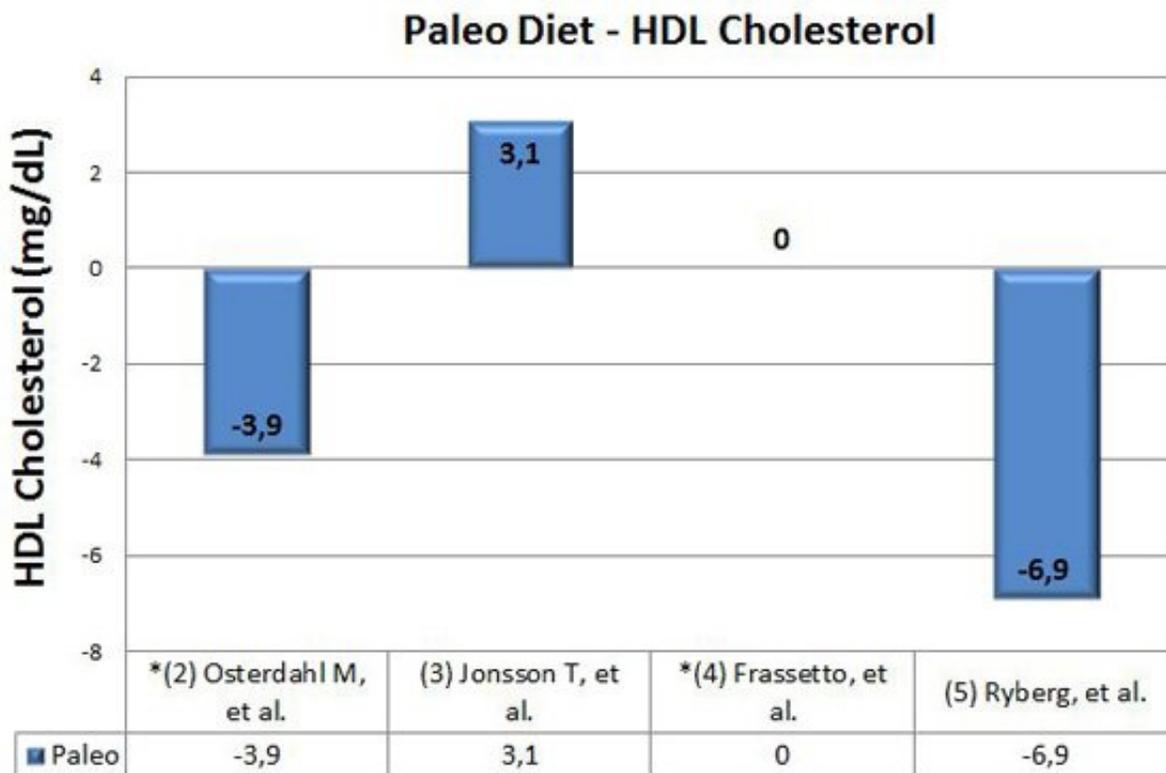
Four of the studies (2-5) reported changes in Total Cholesterol, LDL Cholesterol, HDL Cholesterol and Blood Triglycerides:



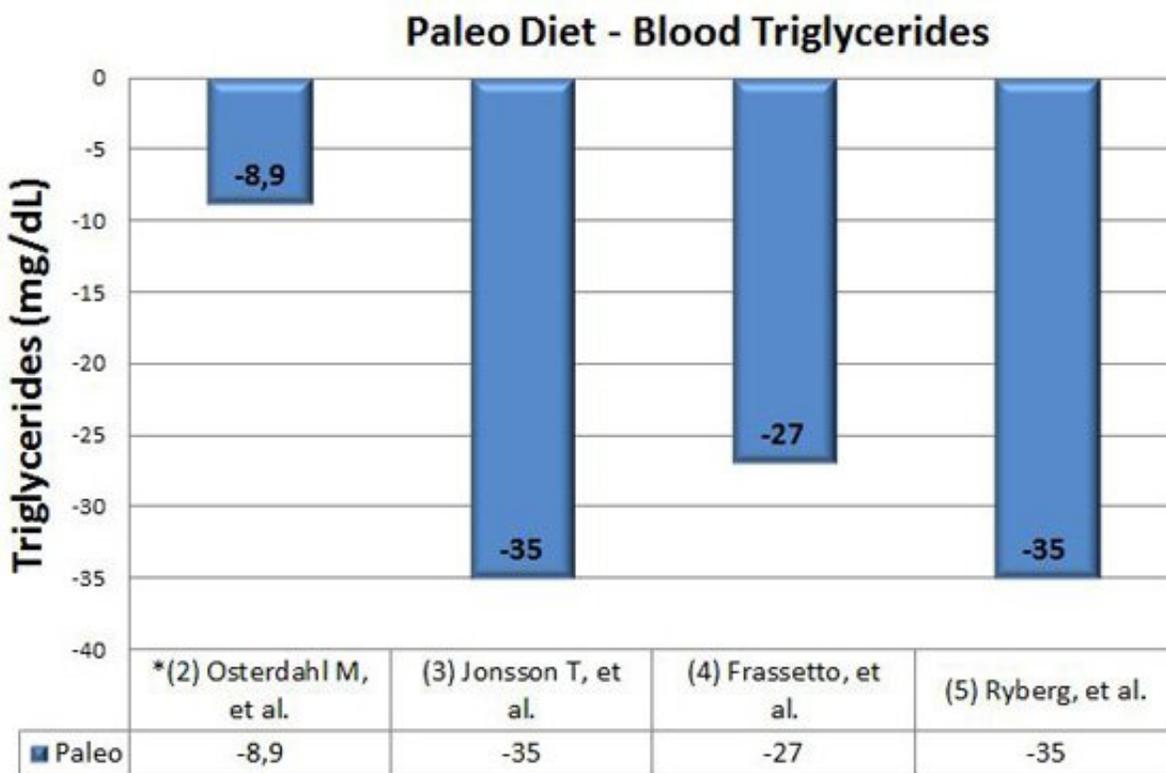
There were reductions in Total Cholesterol in two studies (4, 5), but the difference was not statistically significant in the other two (2, 3).



There was a statistically significant reduction in LDL Cholesterol in two studies (4, 5).



Two of the studies had a statistically significant difference in HDL Cholesterol. One study showed a decrease (5), the other an increase (3).



All of the studies had reductions in blood triglyceride levels, but the difference was not statistically significant in one study (2).

## Blood Sugar and Insulin Levels

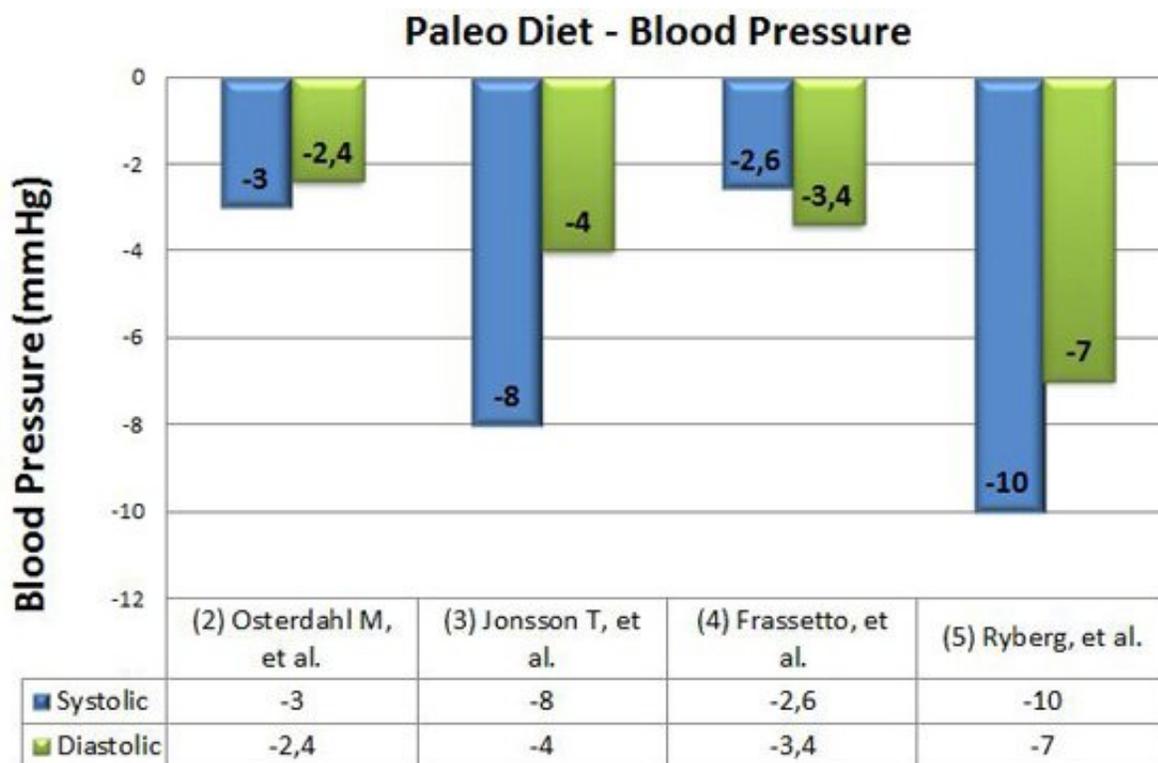
All of the studies looked at markers of blood sugar levels and insulin sensitivity.

However, they used many different methods, so there is no way to compare the results in a graph.

It is clear from looking at the studies that the paleo diet does lead to improvements in insulin sensitivity and glycemic control (1, 3, 5), although the results were not always statistically significant (2, 4).

## Blood Pressure

Four of the studies (2-5) looked at blood pressure levels before and after the intervention.



As you can see, there were mild reductions in blood pressure across the board.

However, only one study (2) reached statistical significance for Systolic Blood Pressure (higher number) while the three others reached statistical significance for Diastolic Blood Pressure (lower number) only.

## Safety

Overall, the paleo diet was very well tolerated and there were no reports of adverse effects.

## Limitations of The Studies

There are several obvious limitations to the studies:

- All 5 studies are small, ranging from 9-29 participants.
- The studies did not last very long, ranging from 10 days to 12 weeks.
- Only 2 out of 5 studies had a control group.

Additionally, the paleo diet used in the studies is not typical for the way paleo is often practiced today. It was a “conventional” paleo diet that restricted all dairy, [sodium](#), emphasized *lean* meats and used canola oil.

Lean meats and canola oil aren't very popular in the paleo community today, but the original book, “The Paleo Diet” by Dr. Loren Cordain, recommended these. All the studies are done on his version of the diet.

## Does The Paleo Diet Work?

Obviously we can't make any **firm** conclusions based on these 5 studies alone, since they are too small and too short in duration.

However, the little evidence we do have is very promising. Hopefully we will see some bigger and longer studies in the near future.