

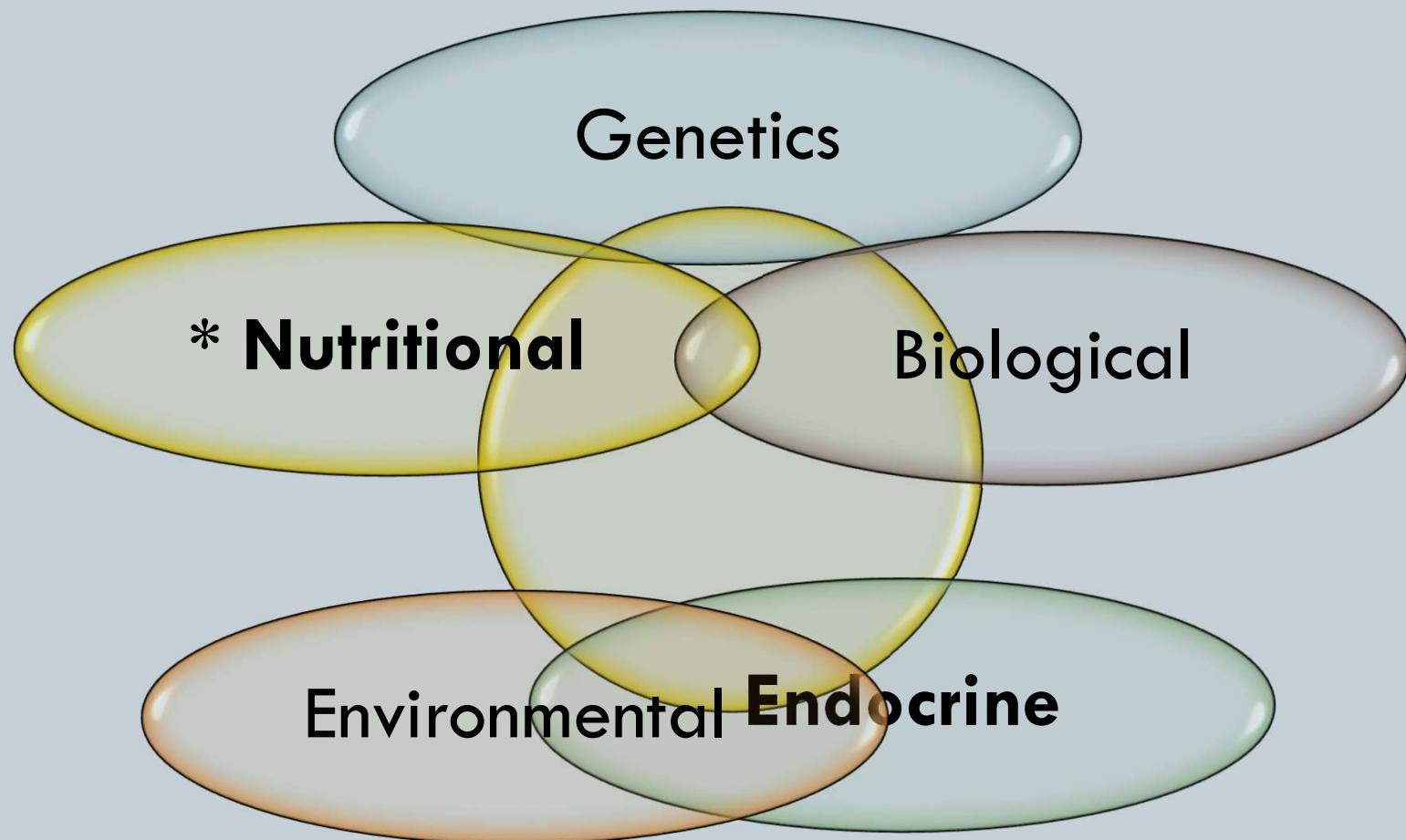
# Nutrition and fertility.

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# Associated factors:



# Involved:

- Optimal nutrition and the life style of the woman and the man prior to the conception contribute to a satisfactory conception.



# Healthy sperm count.

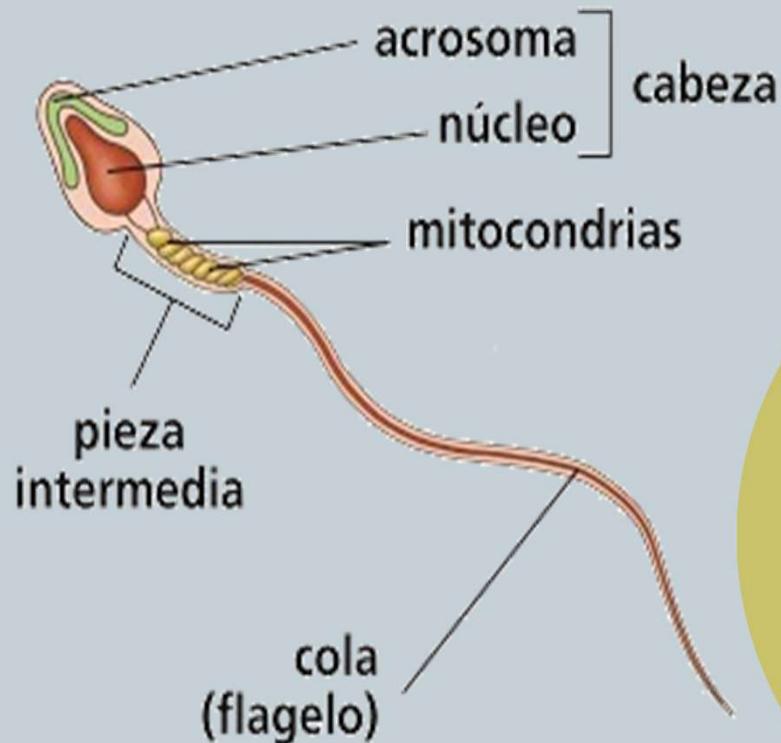
Quantity (concentration).

Morphology (form).

Mobility (movement).



# Spermatogenesis and biochemistry.



The crosoma reactions.

**Calcium.**

**Mobility.**

# Food sources.



- Dairy (milk, yogurt), cheese, green leafy vegetables (broccoli, spinach), almonds, sesame seeds, canned sardines\*.

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recommen  
dation

800-1200

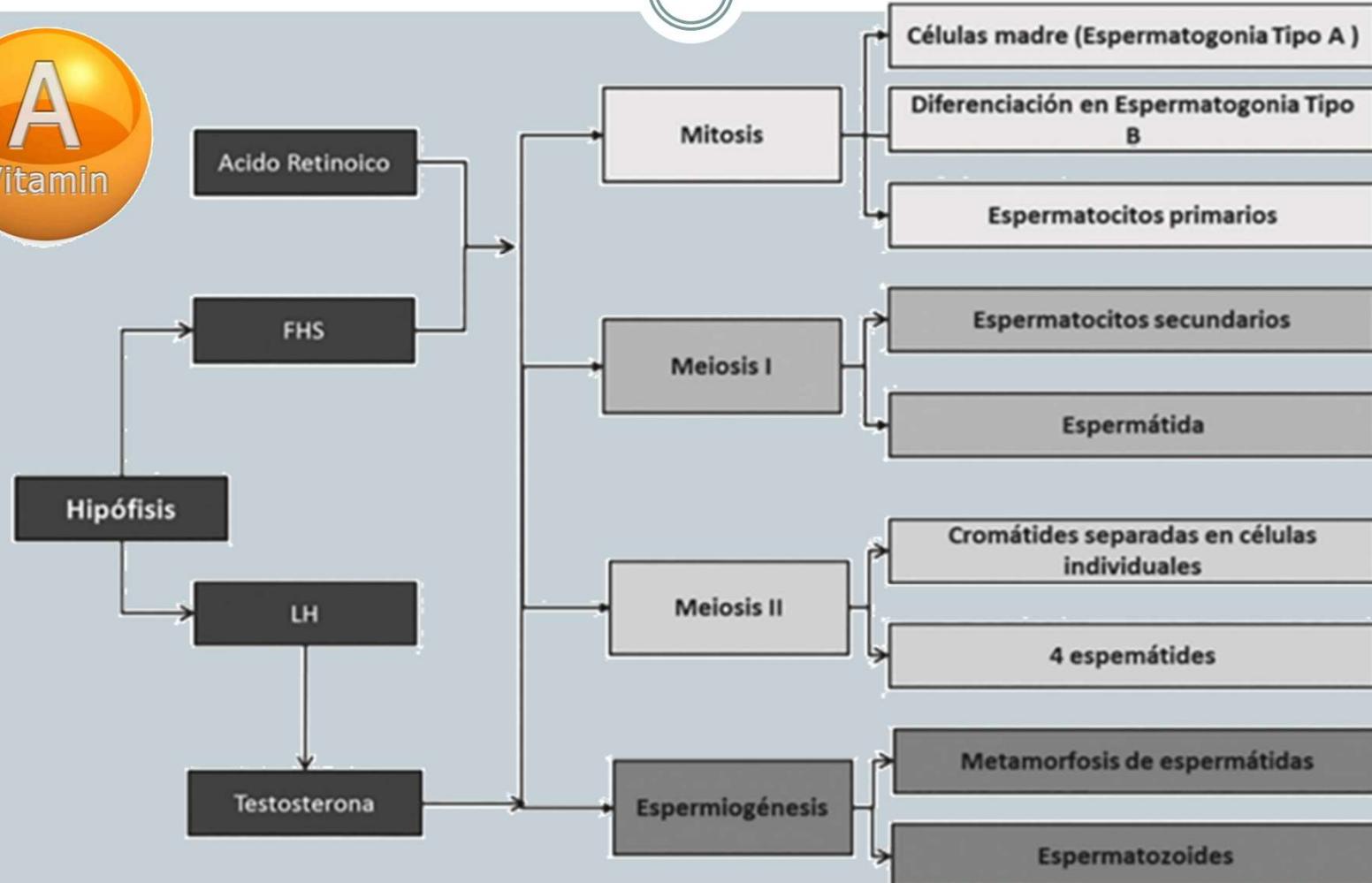
mg/day

## Amount of calcium in different foods.

Food	Content
Cows milk, 250 ml (1 cup).	285 mg
Sesame seeds (30 g; 2 tbsp).	218 mg
Sardines (100 g).	200 mg
Almonds (30 g; 2 tbsp).	149 g
Spinach (100 g; crude).	66 mg
1 medium orange.	52 mg
Beans ( $\frac{1}{2}$ cup cooked).	46 mg
Broccoli (100 g raw, $\frac{1}{2}$ cup ).	44 mg
Chickpeas (100 g, $\frac{1}{2}$ cup cooked)	21 mg

Source: modified from Mahan, Escott-Stump and Raymond (2013).

# A).



# Food sources:

Vitamin A

Fuentes de vitamina A y beta caroteno:



La vitamina A proviene de fuentes animales como la carne, huevos y productos lácteos

El betacaroteno es el precursor de la vitamina A y proviene de los vegetales de hojas verdes, así como de las frutas y vegetales de colores intensos



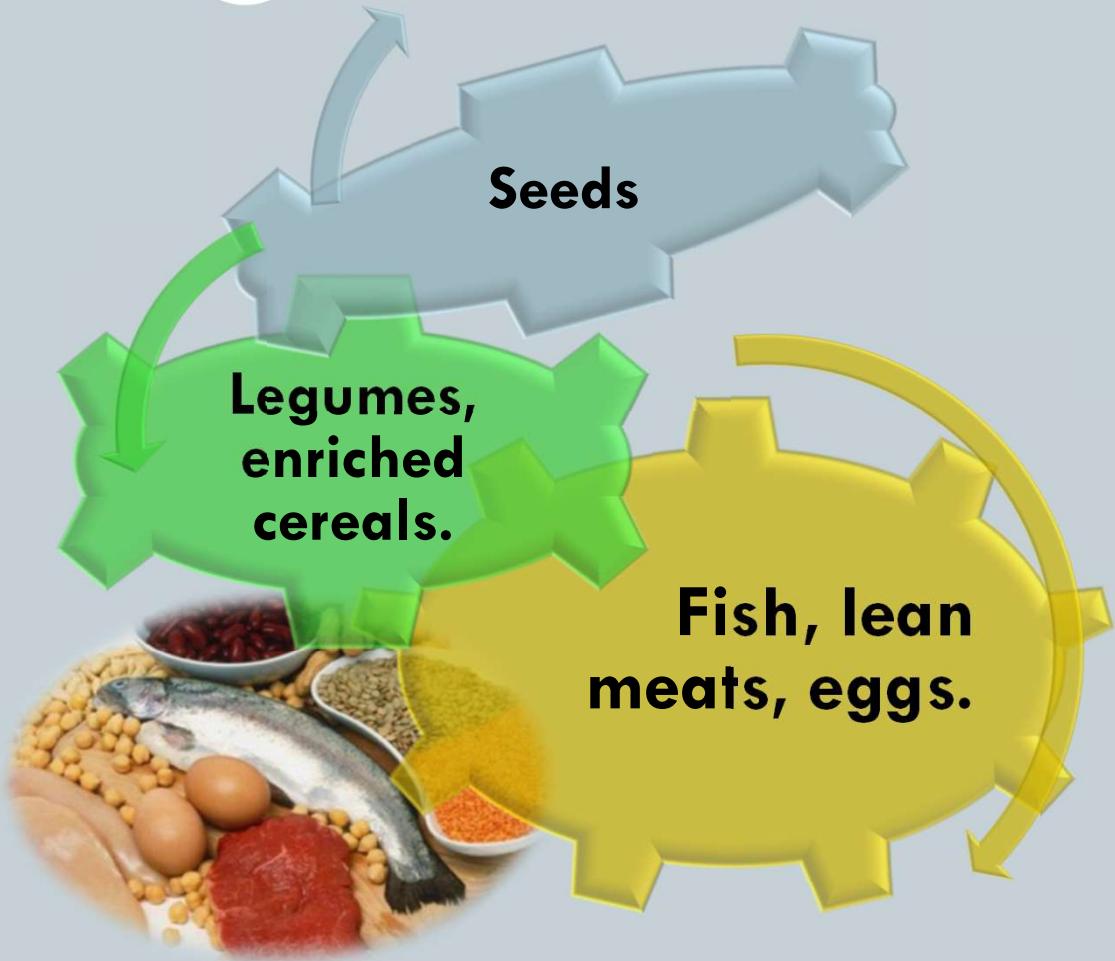
# combine:



Campbell, W.; et al (2015). Effects of egg consumption on carotenoid absorption from co-consumed, raw vegetable. *The American Journal of Clinical Nutrition*. 102 (1): 75–83.

# Sperm and zinc.

Related to the amount and mobility of sperm, [ ] testosterone.



# Sperm and folic acid.

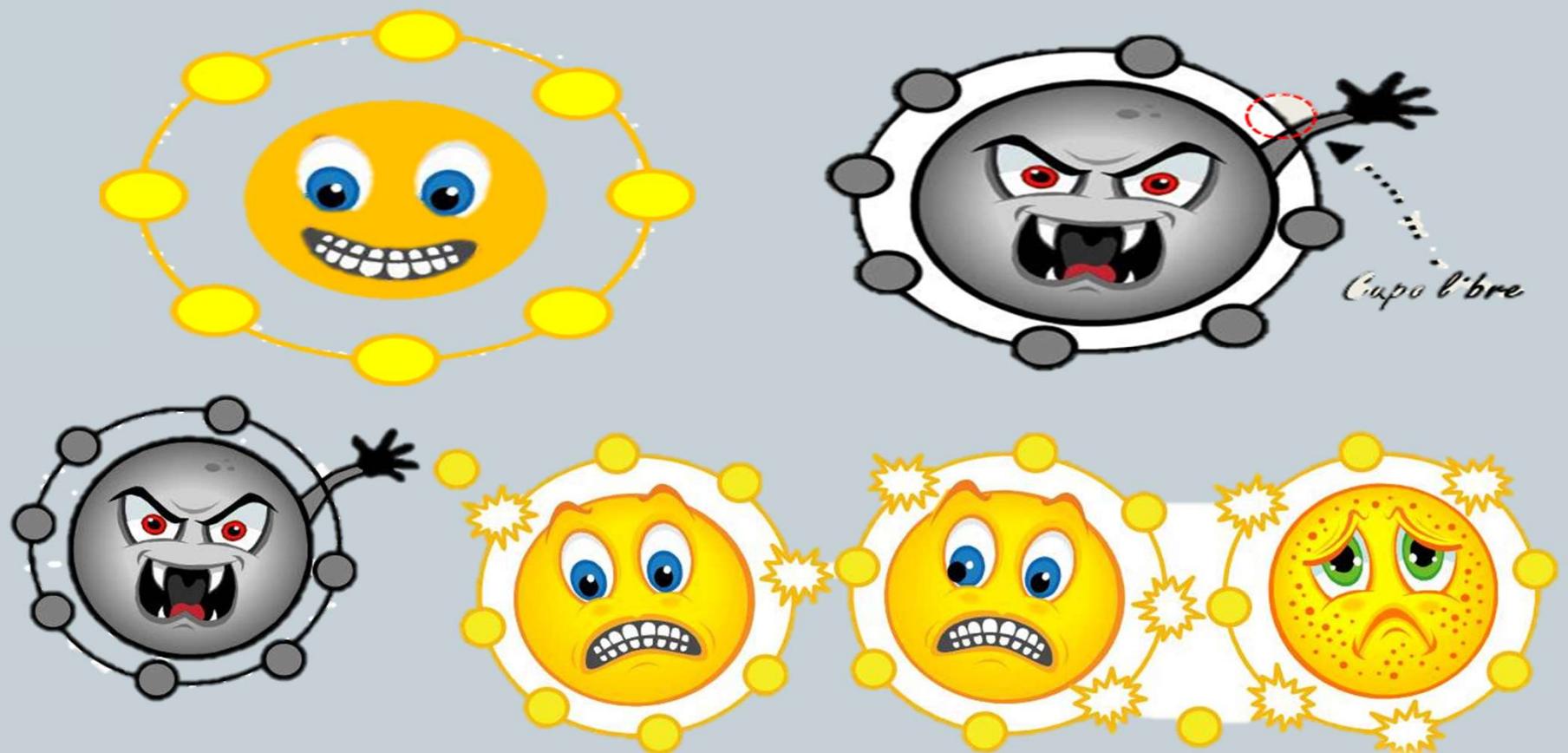
- Wong et al. (2002). Effects of folic acid and zinc sulfate on male factor subfertility: a double-blind, randomized, placebo-controlled trial. *77(3):491-498.*
- Eskenazi et al. (2008). The association of folate, zinc and antioxidant intake with sperm aneuploidy in healthy non-smoking men. *Hum Reprod.* *23(5):1014-22.*

Food	Content
Lentils (150 g).	358 µg
Asparagus (100 g).	243 µg
Broccoli (150 g).	168 µg
Orange juice (250 ml).	75 µg
Plantain (1unit)	24 µg

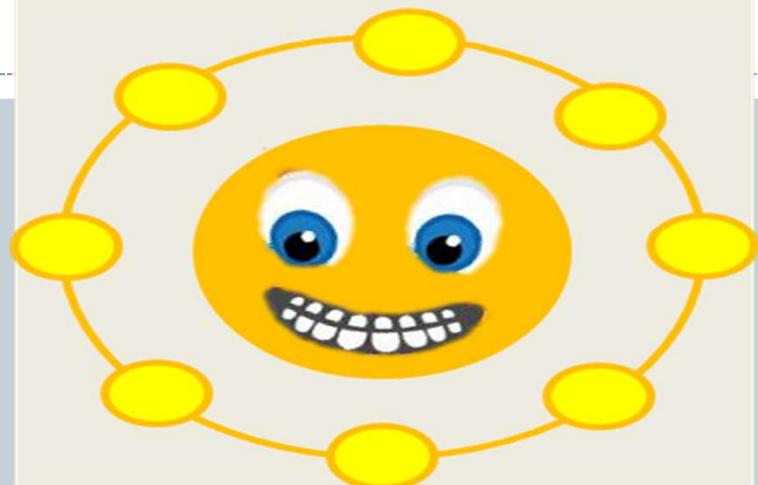


Source: modified from Mahan, Escott-Stump and Raymond (2013).

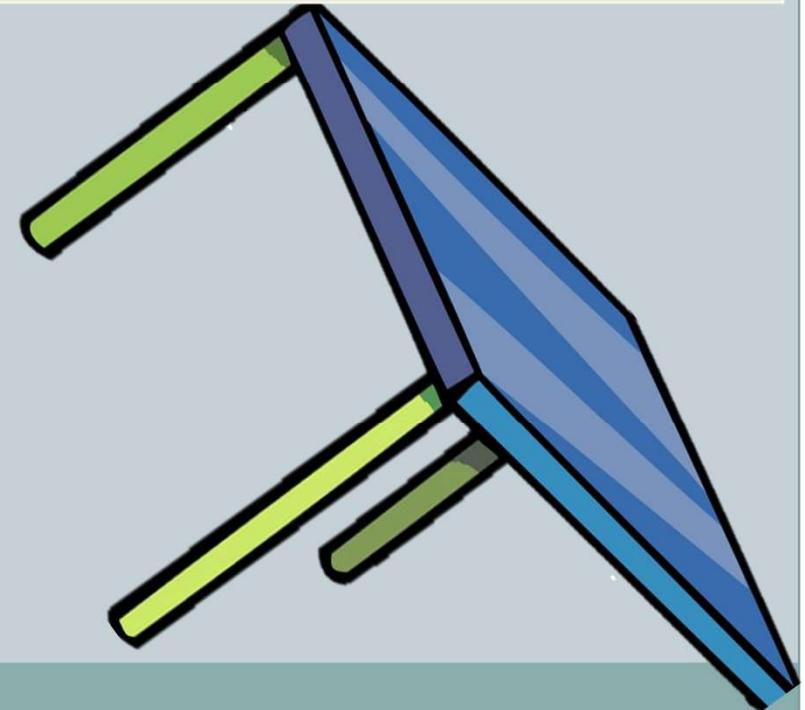
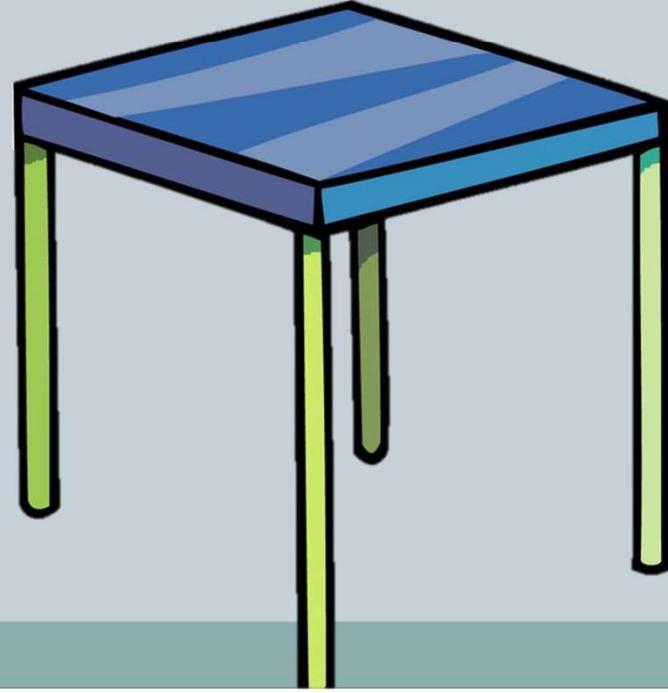
# Free radicals and antioxidants.



**Átomo SANO**



**Radical LIBRE**



# Antioxidants.



Vit.A=  
free  
radicals.

Vit. C=  
morphology  
number

Vit. E=  
mobility

# Are we what dad eats?

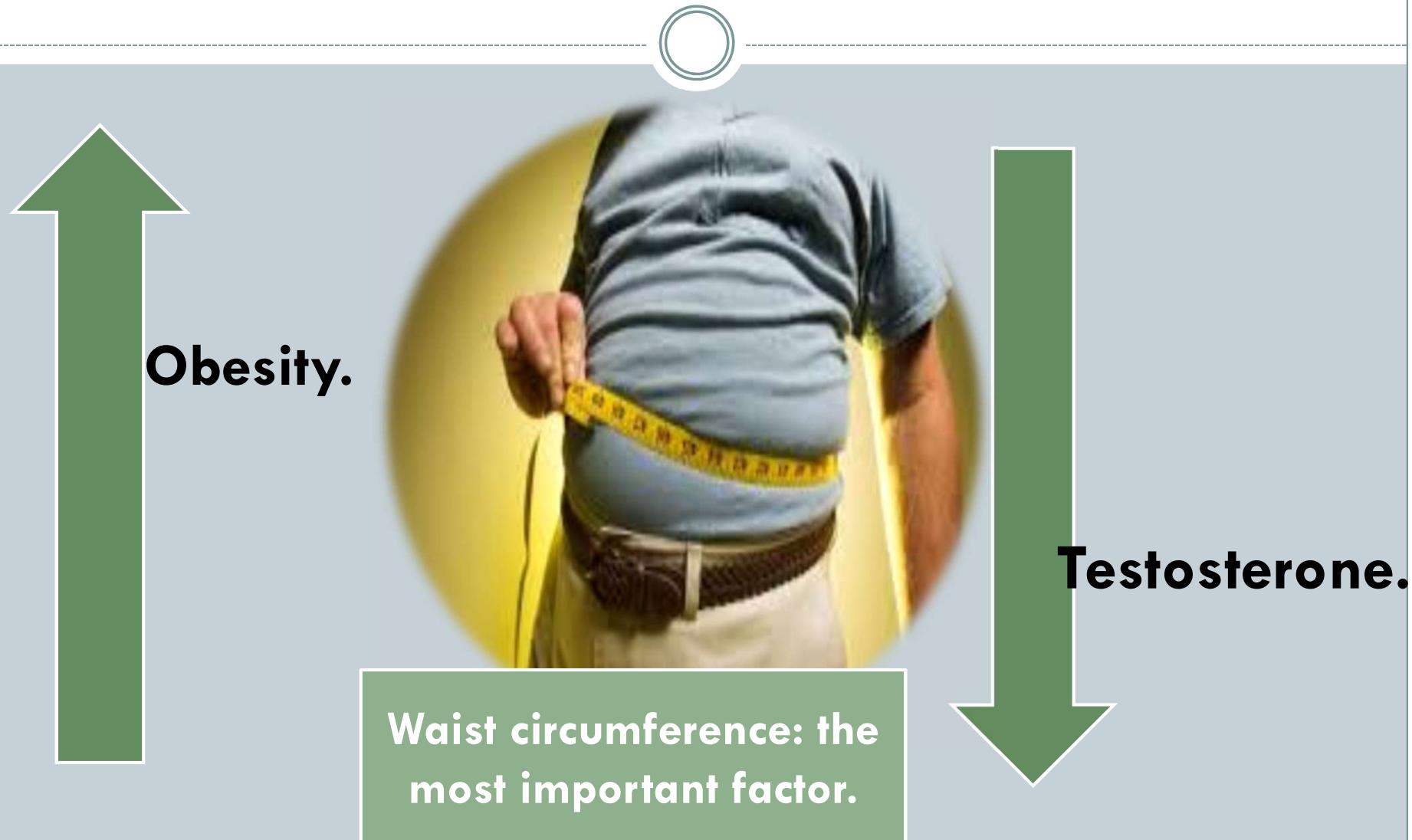
Sperm and genetic load.

- Appetite hormones.
- DNA changes.



Donkin et al. (2015). Obesity and bariatric surgery drive epigenetic variation of spermatozoa in humans. *Cell Metabolism* 23(2): 369 – 378.

# Testosterone and obesity.



# El sobrepeso y la obesidad en el mundo.



Desde 1975,  
la obesidad se ha  
casi triplicado en  
todo el mundo.

2016: Más de **2000 millones** de personas en el mundo con sobrepeso, de los cuales más de **650 millones eran obesos**.

## SOBREPESO:

39% DE LOS ADULTOS (39% DE LOS HOMBRES Y UN 40% DE LAS MUJERES).

## OBESIDAD:

13% DE LOS ADULTOS ( 11% DE LOS HOMBRES Y UN 15% DE LAS MUJERES).

Fuente: WHO/OMS 2016.

# NorthAmerican's Data:

Year 1967:

43% OB = AM, infertility  
and miscarriages.

Year 2000:

70% of women of  
reproductive age were not  
fed properly.

# **Obesity and ovulation.**

**Low IG  
carbohydrates.**

**Vegetable  
protein.**

**High-fat dairy.**

**Monoinst fat.**

**Weight Control  
and activ.  
physical.**

**It has been shown  
that changes in the  
diet reduce the  
ovulatory  
alterations and  
improve fertility.**

# Glycemic index (GI):



- It is a measure of the response of serum glucose to a food with a food reference that contains equal amounts of carbohydrate, that is to say, the GI reflects the level at which a food source of carbohydrates increases the level of blood sugar after eating.



## Interpretation of the Glycemic Index

High

Medium

Low

# Some examples:

High

- White rice, white bread, watermelon, sugary cereals, sugar, bananas, cereal bars.

Medium

- Tortillas, beets, plantains, pasta.

Low

- Strawberries, beans, chickpeas, wholemeal bread, broccoli, quinoa.

# nutrients?



**Vs**



**Light bar of cereal**

**80 calories**

**15 g of carbohydrate**

**0 grams of fiber**

**High glycemic index**

**1 cup strawberries (6-7 units)**

**60 - 80 calories**

**15 g of carbohydrate**

**2.2 grams of fiber**

**Low glycemic index**

# nutrients?



**1 slice of light white bread**

**65 calories**

**11 g of carbohydrate**

**0.7 grams of fiber**

**High glycemic index**



**1 slice of whole wheat bread**

**80 calories**

**15 g of carbohydrate**

**4 grams of fiber**

**Low glycemic index**

**VRS**

# Food sources:



Vegetable protein.

Fat  
monounsaturated.



# Food sources:



High-fat dairy.

Stancliffe, R., Thorpe, T., Zemel, M. (2011). Dairy attenuates oxidative and inflammatory stress in metabolic syndrome. *A J Clin Nutr.* 94(2):422-30.

Koba, K., Yanagita, T. (2014). Health benefits of conjugated linoleic acid (CLA). *Obes Res Clin Pract.* 8(6):525-32.

Mulero, J. et al. (2011). Bioactive peptides. *Clinica e Investigación en Arteriosclerosis (Clinic and Research in Atherosclerosis).* 23(5): 219-227.

# Polycystic ovary syndrome:

Carbohydrates

Complex: Yes  
Simple: No

Raw vegetables

Fat

Monounsaturated

Physical activity.

↓ 5% of your body weight can help control the hormonal imbalance.





## COMPLEX CARBOHYDRATE:

High in fiber

Low GI

Satiety

They stimulate the metabolism

## SIMPLE CARBOHYDRATES:

Low in fiber

High GI

Hunger

**Patient ♀ , 30 years has IBS, PCOS, OB. Biochemical data reveal Dyslipidemia (HDL under, hypertriglyceridemia) pre-diabetes and hyperinsulinemia (27 ERUs/ml). He reports that his usual consumption is as follows:**

<b>BREAKFAST:</b>	Sandwich 1 slice of light bread, cheese and 1 tablespoon of mashed beans, 1 cup of watermelon. 1 glass of Clight.
<b>MORNING SNACK:</b>	1 light yogurt, 1 banana.
<b>LUNCH:</b>	$\frac{1}{2}$ cup of rice, 1 fried fish filet, 1 cup of lettuce, 1 light green tea.
<b>AFTERNOON SNACK:</b>	1 bar of low-fat, 1 cup of light tea granola, 1 hour later: 2 plums.
<b>DINNER:</b>	2 homemade burritos made with light tortillas, chicken fajitas, spinach, light mayonnaise, and 1

# Mediterranean diet and fertility.



↑ the possibility of pregnancy.



↑ the mobility of the sperm.

Cutillas, A. et al. (2015). Mediterranean and western dietary patterns are related to markers of testicular function among healthy men. *Human Reproduction*. 1-11.

Mendiola; J. et al. (2010). A low intake of antioxidant nutrients is associated with poor semen quality in patients attending fertility clinics. *Fertility and Sterility*. 93 (4) : 1128 – 1133.

# Vitamin B6.

It intervenes in the metabolism of steroids.

Legumes, fortified breakfast cereals, wheat, potato, sweet corn, **meats (beef and chicken), egg, dried fruit (seeds, nuts), spinach.**



# Vitamin E.

D	L	M	M	J	V	S
					1	2
3	X	5	X	7	X	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30



**Food sources:** olive oil, seeds (peanuts, almonds, walnuts) and in plants such as broccoli, spinach and asparagus .

# Vitamin D.



Cheese



Eggs



Milk



Sunlight



Yogurt



Fish, salmon,  
tuna



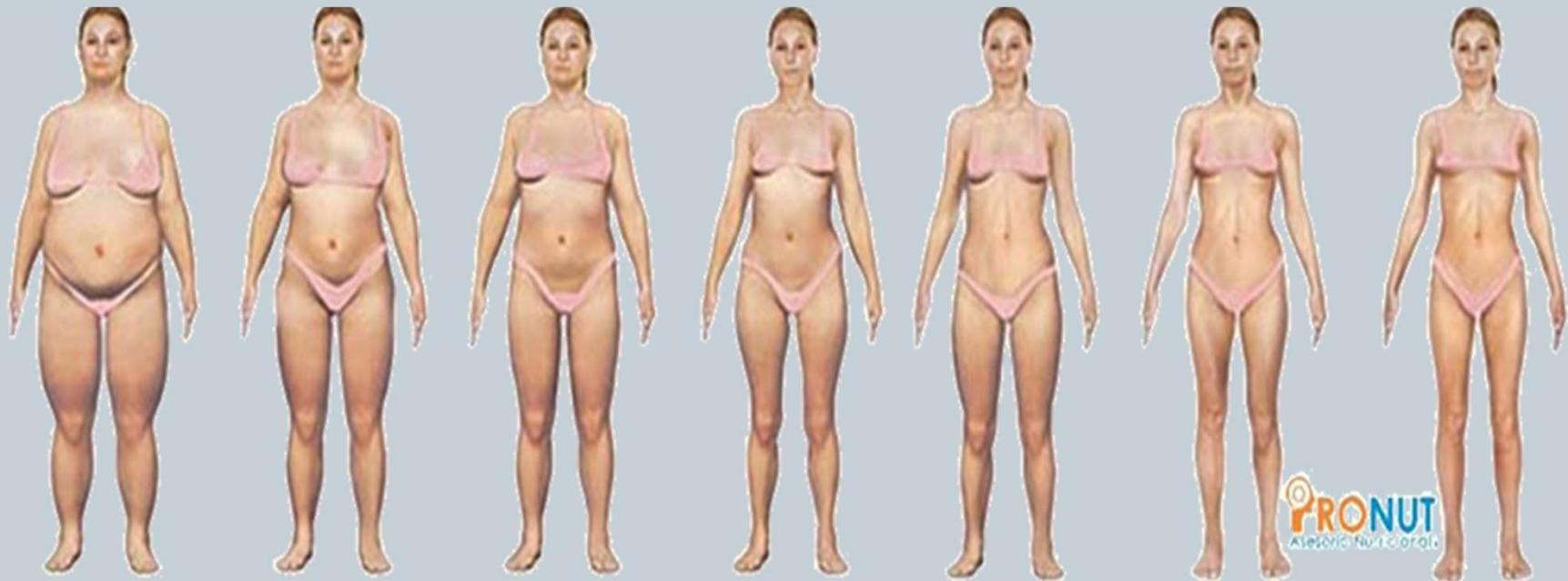
Fortified orange  
juice

National institute of Environmental Health Science of the United States (2016).

López, V. et al. (2016). The role of Vitamin D3 on human reproduction. Rev Iberoamericana de fertilidad y reproducción humana. 31(3).

# low body fat %.

45%      40%      35%      30%      25%      20%      15%



**PRONUT**  
Aesthetic Nutrition

- -17% = Anovulation; amenorrhea.
- -22% = alterations in ovulation.

# high body fat %:



- Nutritional status prior to conception.
- Eating habits prior to pregnancy.
- Fatty tissue= endocrine organ.

Pérez, A. et al. (2015). Role of leptin in female reproduction. *Clinical Chemistry and Laboratory Medicine*. 53(1):15-28.

Toro, F. et al. (2014). Leptin Is an Anti-Apoptotic Effector in Placental Cells Involving Downregulation. *PLoS One*. 9(6): 1-12.

García, D. et al (2011). Adipose tissue as an endocrine gland. *Magazine Finlay*. 1(2): 131-151.

discussing with

# fertility.

**NO COUNTRY COMPLIES WITH THE  
RECOMMENDED STANDARDS ON  
BREASTFEEDING.**

**OMS, UNICEF, ONG Global Breastfeeding; 2017.**

**Exclusive breastfeeding until 6 months:**

Free demand.

During the day and the night.

Extraction at least every 3 hours.

Do not use a bottle or lollipop.

Do not place food or liquids, not even water.

# Fertility: clinical - nutritional factors to consider.

## Nutritional status.

- Under weight, SP, OB, OB AB.

## Pathologies (diseases).

- DM, hormonal disorders.

## Food.

- Ca, Zn, AF, A-OX, Vit: A, D, E, C, B6.
- Glycemic index, dietary fat.

## Lifestyle.

- Physical activity, alcohol and tobacco.

# Conclusion.





# Thank you!

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