

HIGH-FRUCTOSE CORN SYRUP (HFCS) FOODS



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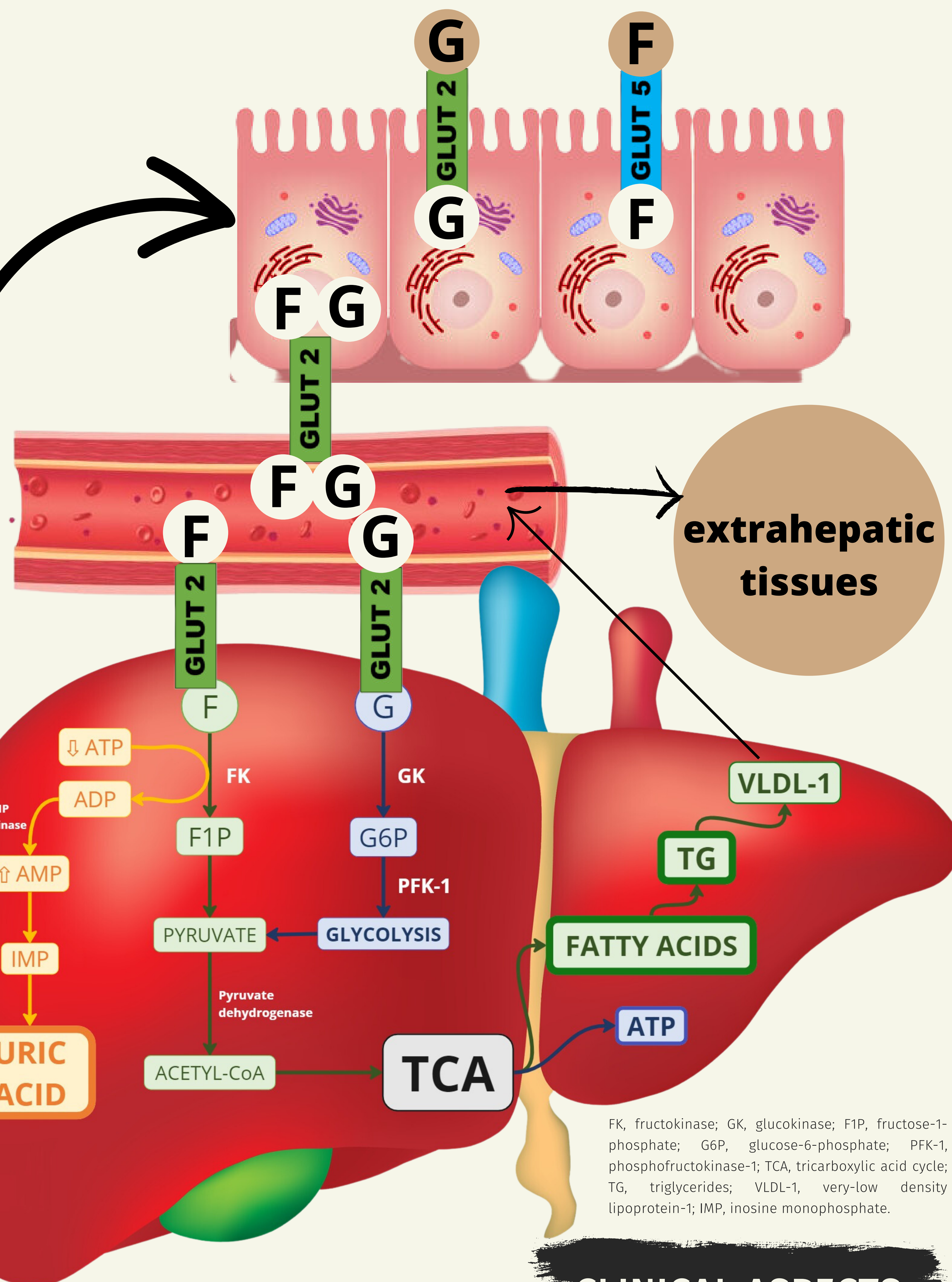
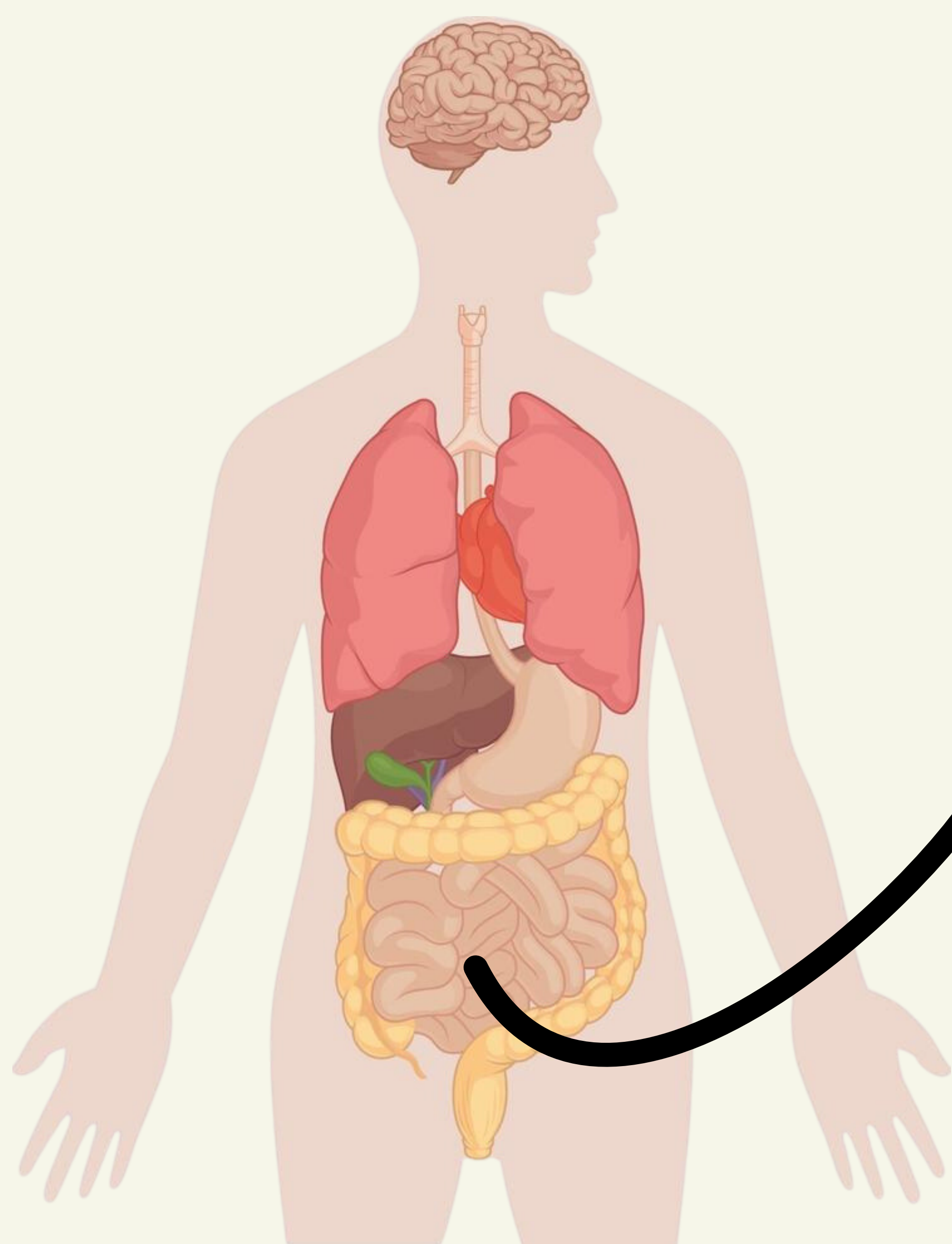
INTRODUCTION

HFCS is a liquid sweetener made of corn starch used in many foods and beverages as an **alternative to sucrose**.

There are various HFCS formulations, such as HFCS-42, HFCS-90 and, HFCS-55.

OBJECTIVES

- Determine the **metabolism of fructose**.
- **Compare** the metabolism of fructose along the metabolism of glucose in the liver.
- Determine the **clinical aspects** of an excess dietary consumption of fructose due to its metabolism.



CONCLUSIONS

- Fructose and glucose are isomers but differ in their initial hepatic metabolism: **glucose** is metabolised by GK and **fructose** is metabolised by FK.
- **Glucose** metabolism in the liver only happens when there is an **excess** ingestion and it is **regulated** by PFK-1. However, **fructose** is directly transported into the liver and its metabolism will not be inhibited by an excess, following always DNL.
- An **excess** consumption of added fructose in processed foods and SSBs for a long period of time is the **major** cause of long-term effects on health.

Intestinal and hepatic absorption of fructose and glucose and its metabolism routes in the liver with its end products and destinations. Own elaboration.

CLINICAL ASPECTS

- NAFLD and obesity
- Hyperuricemia
- ER stress → pancreatic β -cells
- Hepatic insulin resistance and T2DM
- Metabolic syndrome

FK, fructokinase; GK, glucokinase; F1P, fructose-1-phosphate; G6P, glucose-6-phosphate; PFK-1, phosphofructokinase-1; TCA, tricarboxylic acid cycle; TG, triglycerides; VLDL-1, very-low density lipoprotein-1; IMP, inosine monophosphate.