# Differentiating between



# PLANT PHYTOESTROGENS (ISOFLAVONES) AND ESTROGEN



### WHAT IS ESTROGEN?

A hormone produced by both women and men<sup>1</sup>



## WHAT ARE PHYTOESTROGENS?

Naturally occurring compounds in plants that share some similarities with estrogen



# WHAT ARE ISOFLAVONES?

A type of phytoestrogen that is found in many plants, but especially soybeans<sup>2</sup>



#### WHY ARE ESTROGEN & ISOFLAVONES DIFFERENT?

Isoflavones bind to estrogen receptors in cells in a manner that differs from the way estrogen does<sup>3</sup>

#### **QUICK FACTS**

- 1 Soyfoods do not contain estrogen
- 2 Soybean isoflavones differ in multiple ways from estrogen<sup>4</sup>
- 3 Isoflavones may be protective against breast cancer 5-6
- 4 Isoflavones have no effect on the uterus or endometrium<sup>7-10</sup>
- 5 Isoflavones do not lower testosterone in men, and do not affect sperm or semen<sup>11-12</sup>

#### Visit SoyConnection.com for more information on soy health

- 1. Simpson ER. Sources of estrogen and their importance. J Steroid Biochem Mol Biol 2003;86:225-30.
- Clarke DB, Lloyd AS, Lawrence JM, Brown JE, Storey L, Raats M, Rainsbury RM, Culliford DJ, Bailey-Horne VA, Parry BM. Development of a food compositional database for the estimation of dietary intake of phyto-oestrogens in a group of postmenopausal women previously treated for breast cancer and validation with urinary excretion. Br J Nutr 2013;109:2261-8.
- 3. Oseni T, Patel R, Pyle J, Jordan VC. Selective estrogen receptor modulators and phytoestrogens. Planta Med 2008;74:1656-65
- Messina M, Mejia SB, Cassidy A, Duncan A, Kurzer M, Nagato C, Ronis M, Rowland I, Sievenpiper J, Barnes S. Neither soyfoods nor isoflavones warrant classification as endocrine disruptors: a technical review of the observational and clinical data. Crit Rev Food Sci Nutr 2021:1-57.
- Okekunle AP, Gao J, Wu X, Feng R, Sun C. Higher dietary soy intake appears inversely related to breast cancer risk independent of estrogen receptor breast cancer phenotypes. Heliyon 2020;6:e04228.
- Fan Y, Wang M, Li Z, Jiang H, Shi J, Shi X, Liu S, Zhao J, Kong L, Zhang W, et al. Intake of soy, soy isoflavones and soy protein and risk of cancer incidence and mortality. Frontiers in nutrition 2022;9:847421.
- Mareti E, Abatzi C, Vavilis D, et al. Effect of oral phytoestrogens on endometrial thickness and breast density of perimenopausal and postmenopausal women: A systematic review and meta-analysis. Maturitas. 2019;12481-8.

- https://www.semanticscholar.org/paper/Effect-of-oral-phytoestrogens-on-endometrial-and-of-Mareti-Abatzi/d562204ead8a485909e3a1e985700c88b8632e6f.
- Fan Y, Wang M, Li Z, Jiang H, Shi J, Shi X, Liu S, Zhao J, Kong L, Zhang W, et al. Intake of soy, soy isoflavones and soy
  protein and risk of cancer incidence and mortality. Frontiers in nutrition 2022;9:847421.
- EFSA. EFSA ANS Panel (EFSA Panel on Food Additives and Nutrient Sources added to Food), 2015. Scientific opinion on the risk assessment for peri- and post-menopausal women taking food supplements containing isolated isoflavones. EFSA J. 13/246 (342 pp.) 2015.
- Zhong XS, Ge J, Chen SW, Xiong YQ, Ma SJ, Chen Q. Association between dietary isoflavones in soy and legumes and endometrial cancer: A systematic review and meta-Analysis. Journal of the Academy of Nutrition and Dietetics 2018;118:673-51.
- Messina M, Mejia SB, Cassidy A, Duncan A, Kurzer M, Nagato C, Ronis M, Rowland I, Sievenpiper J, Barnes S. Neither soyfoods nor isoflavones warrant classification as endocrine disruptors: a technical review of the observational and clinical data. Crit Rev Food Sci Nutr 2021:1-57.
- Reed KE, Camargo J, Hamilton-Reeves J, Kurzer M, Messina M. Neither soy nor isoflavone intake affects male reproductive hormones: An expanded and updated meta-analysis of clinical studies. Reprod Toxicol 2021;100:60-7