

VALUE CHAIN OF MORINGA

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Botany

- Kingdom Plantae
- Group Angiosperms
- Unknown Eddicots
- Unknown Rosids
- Order Brassicales
- Family Moringaceae
- Genus Moringa
- Species oleifera

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Species

M. oleifera

M. peregrina

M. stenopetala

M. drouhardii

Origin

- Native to soethern foothills of the Himalayas in northwestern India.
- It is called Drumstick tree, horseradish tree, benzoil tree
- Widely cultivated in the tropics and sub-tropics
- Used in water purification, as a vegetable and widely used as medicine.

Production

- India 1.3 million t from 380 km²
- Andhra (157 km², Karnataka (103 km²) and Tamil Nadu (74 km²).
- Home gardens in India, Thailand, Philippines, Malaysia and Indonesia
- It grows wild or cultivated in Central America, Caribbean, South America, Africa and Oceania
- In 2010 Hawaii has started its cultivation

Production

- Tree is ready for harvest in 6 to 8 months for leaves. Yield is around 6t/ha.
- Dwarf trees can be harvested 60 days after planting. Cut 60cm to the ground.
- Year 2 pods yield will be 300 per plant; year 3 onwards 400 to 500. Maximum can be 1000 pods per plant. Yield 31t pods/year/ha.
- Moringa seed oil yield can be 250t/ha.

Production

- **In one study in Nicaragua**
- **There were 9 cuttings of leaves per year and for four years the total yield was 174t of leaves. That is about 43t of leaves per year.**

NUTRITIONAL CONTENTS

- Drymatter (g) 21-29
- Protein (g) 2.9-5.8
- β -carotene (mg) 5-15
- Ascorbate (mg) 249-400
- Tocopherol(mg) 14-28
- Iron (mg) 5.4-9.2
- Calcium (mg) 458-711

Yang,et.al. 2006

Table 3. Means of nutrient values¹ of 10 *M. oleifera* accessions with three harvests

per 100 g fresh weight	Mature leaves			Young shoots		
Dry matter, g	22.2	±	1.6	15.1	±	2.7
Protein, g	6.9	±	0.8	4.28	±	0.91
Fiber, g	1.75	±	0.24	1.47	±	0.17
Sugar, g	2.93	±	0.44	2.2	±	0.41
Calcium, mg	454	±	63	82	±	31
Iron, mg	6.7	±	2.8	2.8	±	1.5
Carotene, mg	13.9	±	5.2	4.1	±	2.2
Vitamin C, mg	257	±	53	244	±	54
Vitamin E, mg	16.7	±	3.2	4.3	±	1.9
TEAC ² , µmol TE	3629	±	1257	23.4	±	926
Total phenolics, mg	680	±	116	581	±	134

¹ Values were mean ± SD; *n* = 90 including 10 accessions, 3 replications and 3 harvests in June 2004, and January and April 2005.

² TEAC: Trolox equivalent antioxidant capacity, an antioxidant assay using ABTS radicals; TI: Trolox equivalent



YOUNG PLANTS OF MORINGA



Moringa oleifera



Moringa thouarsii

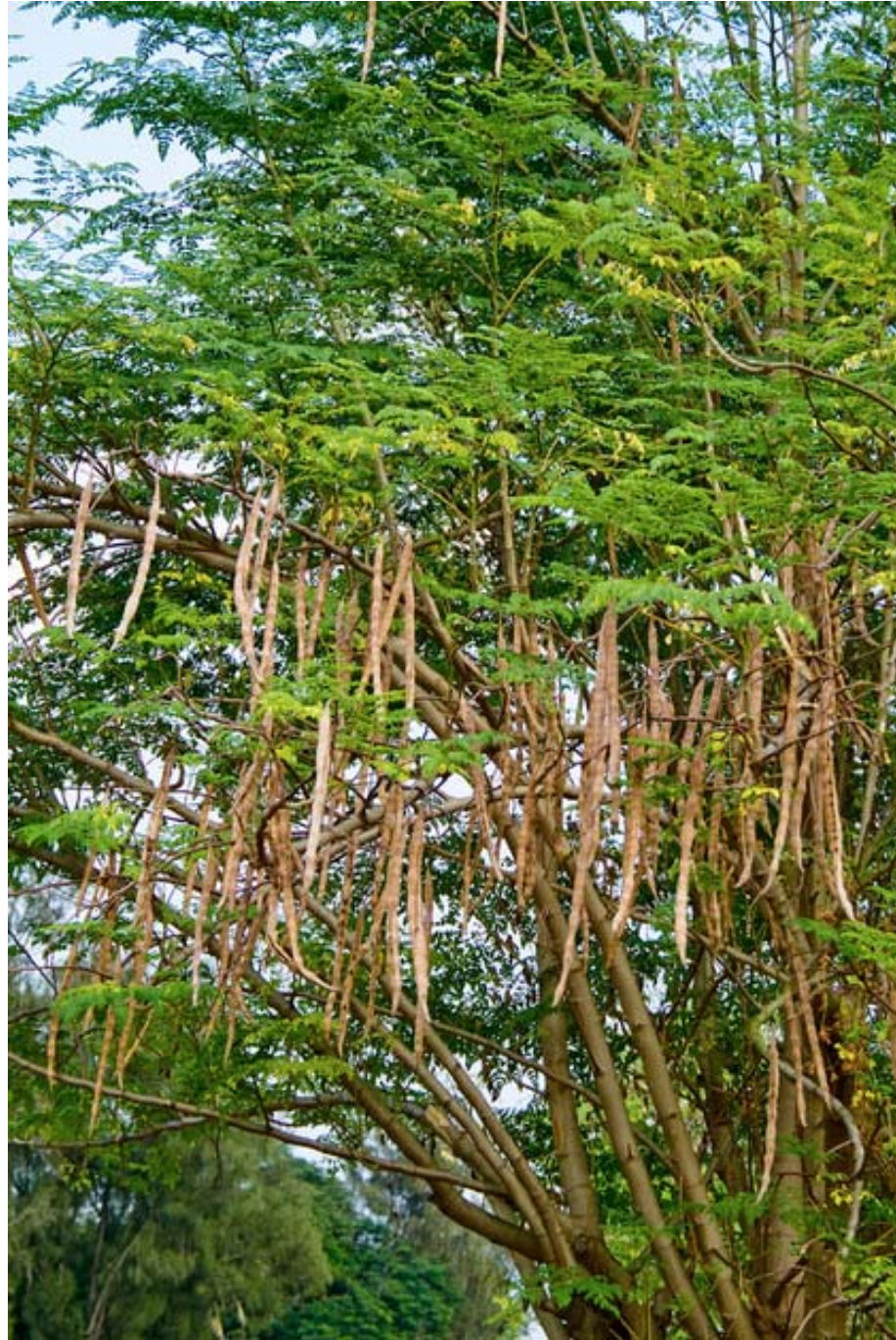






MORINGA TREE























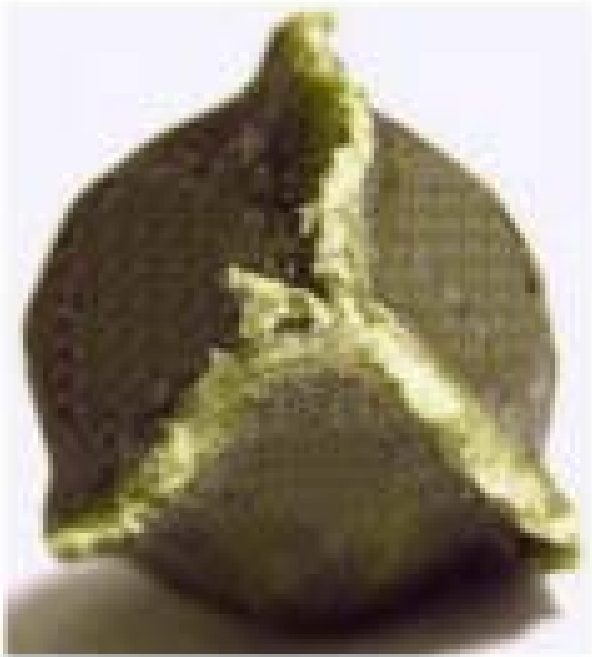
MORINGA SEEDS



Moringa seeds



Moringa seeds with and without membranous covering





MATURE POD WITH SEEDS



MORINGA FLOWER









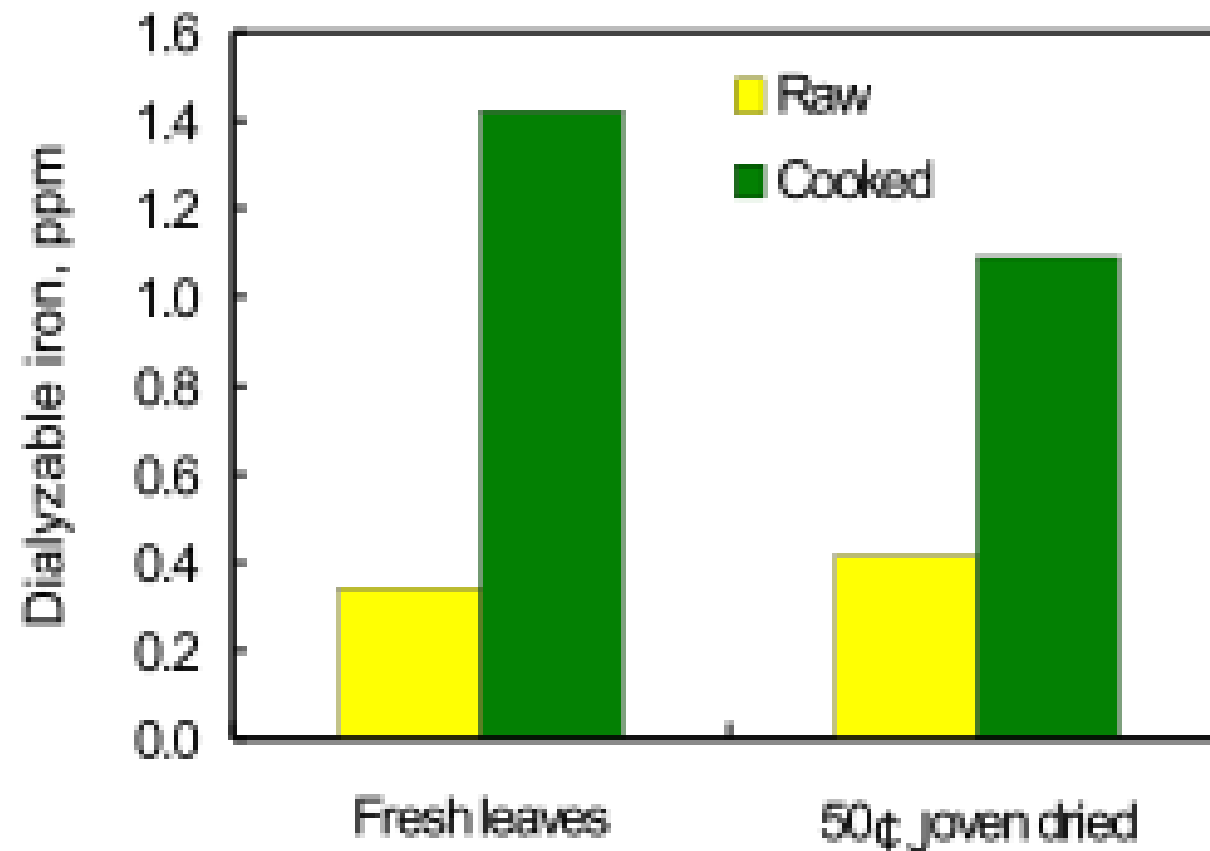




Figure 2. Moringa young shoots

RESEARCH ON NUTRIENTS

- SLOW DRYING OF LEAVES OR OTHER PARTS OF THE PLANT RETAINS ALMOST ALL THE NUTRIENTS AND MINERALS.
- DRYING AT 50 DEGREES REDUCES THE VITAMIN C AND BETA CAROTENE LEVELS BY AROUND 50% AND 25% RESPECTIVELY



e 4. In vitro iron bioavailability of Moringa leave

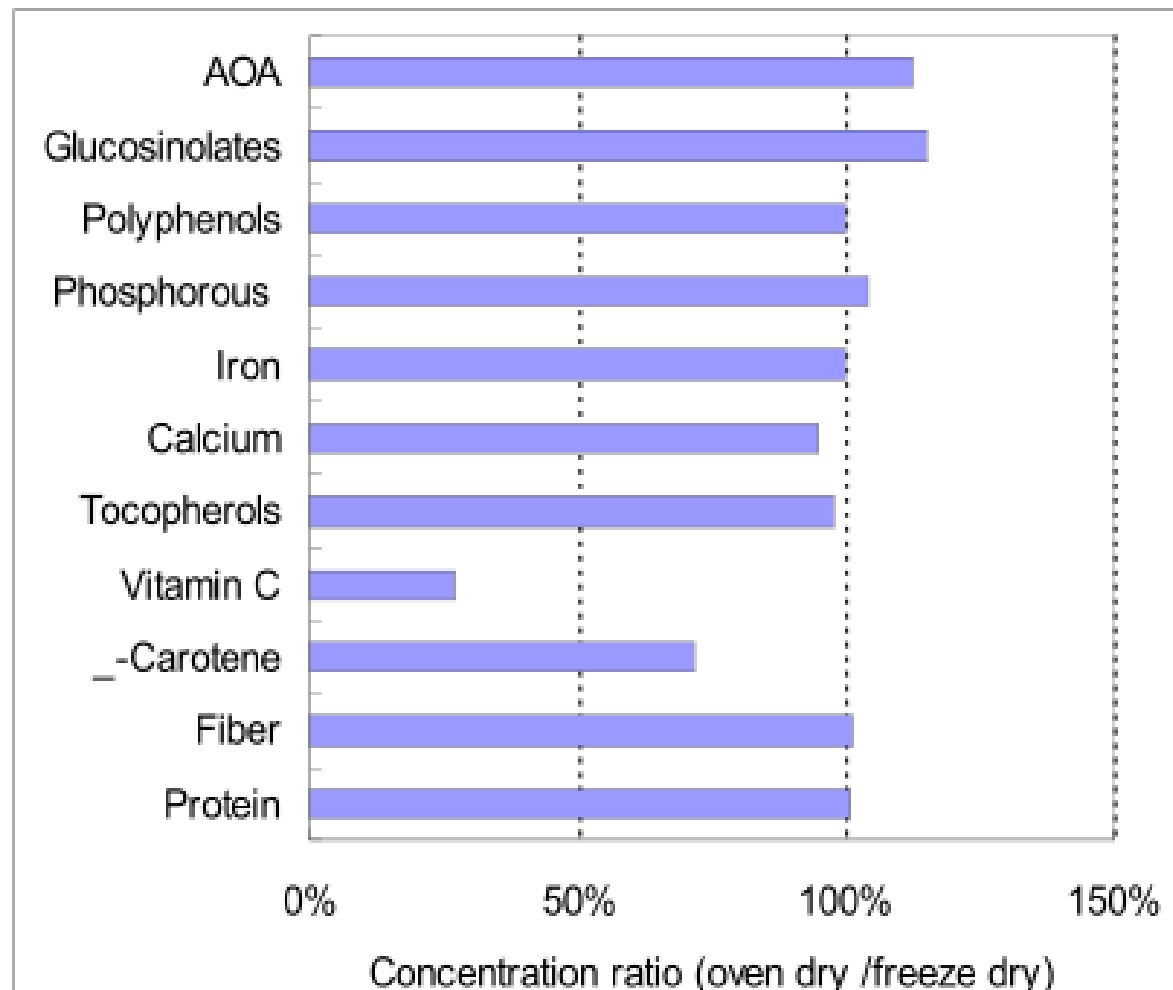


Figure 3. Ratio of nutrient and phytochemical content of oven dried leaves to freeze dried leaves. AOA: antioxidant activity; TG total glucosinolates

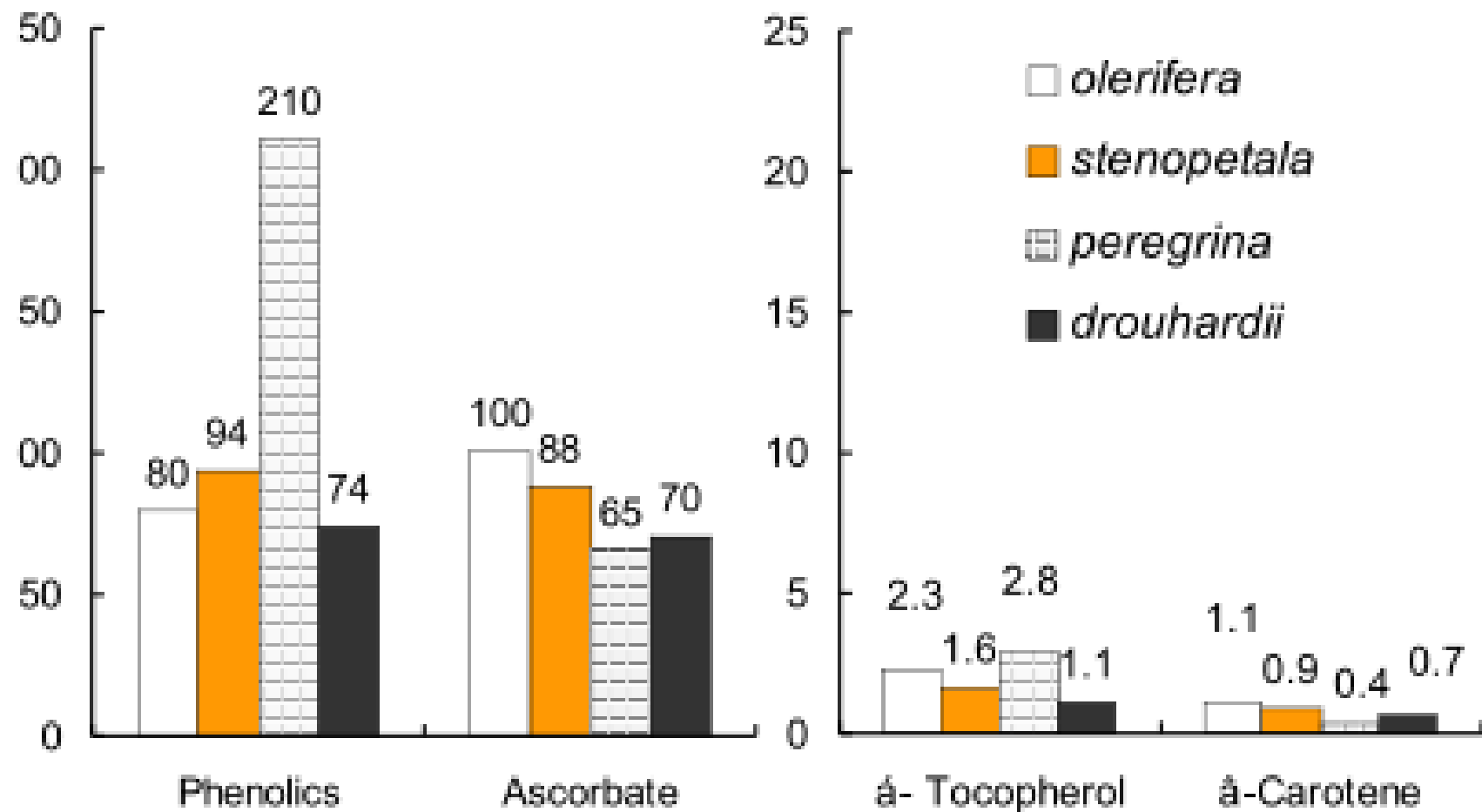


Figure 1. Antioxidant contents of the four Moringa species

Moringa Soup



Moringa with fish curry







NATURE'S MEDICINE CABINET

Supreme Quality
Dehydrated
Moringa Oleifera
Leaves

MORINGA

Green Tea

Experience The Miracle

Exclusively Produced / Marketed Via Internet Only

Moringa Resources

KM 1, Jalan Gedong, 94707 Serian,
Sarawak, Malaysia.

TEL: 016-8986575 / 017-6956175

www.moringa.com.my

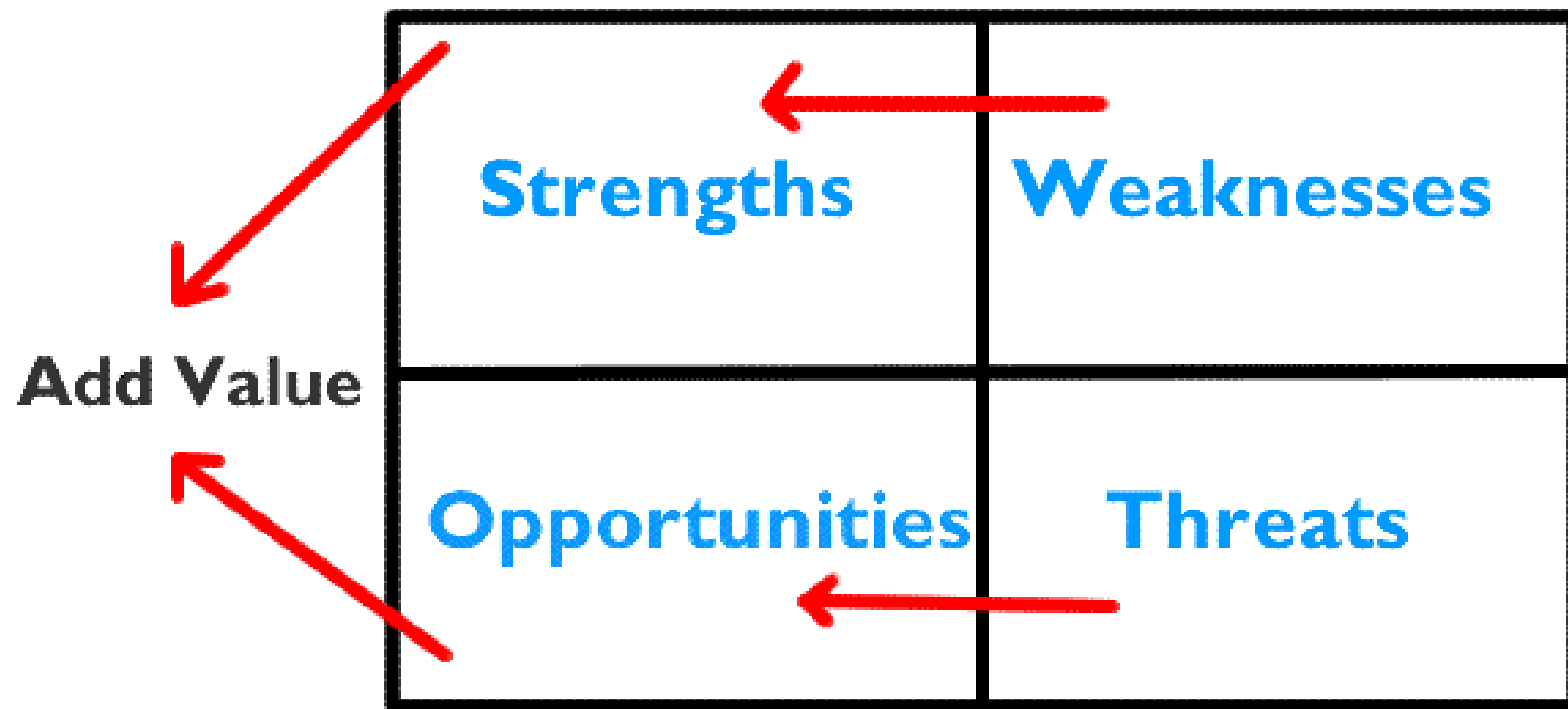


WHOLE
FOODS





Value Addition



Add Value

SWOT Analysis

Internal	Strengths <ul style="list-style-type: none"> Advantages <ul style="list-style-type: none"> Financial reserves, likely returns Accreditations, qualifications, certifications Competitive advantages Capabilities <ul style="list-style-type: none"> Location and geography Innovative aspects Resources, Assets, People <ul style="list-style-type: none"> Processes, systems, IT, communications Culture, attitudes, behaviors Management cover, succession Experience, knowledge, data Patents Strong brand names Marketing - reach, distribution, awareness <ul style="list-style-type: none"> USP's (unique selling points) Price, value, quality 	Weaknesses <ul style="list-style-type: none"> Lack of competitive strength <ul style="list-style-type: none"> Gaps in capabilities Disadvantages of proposition Weak brand name Financials <ul style="list-style-type: none"> Cash flow, startup cash-drain High cost structure Our vulnerabilities <ul style="list-style-type: none"> Timescales, deadlines and pressures Reliability of data, plan predictability Continuity, supply chain robustness Processes and systems, etc <ul style="list-style-type: none"> Management cover, succession Morale, commitment, leadership
	Opportunities <ul style="list-style-type: none"> Market developments <ul style="list-style-type: none"> Competitors vulnerabilities Niche target markets <ul style="list-style-type: none"> New USP's New markets, vertical, horizontal <ul style="list-style-type: none"> Partnerships, agencies, distribution Geographical, export, import Unfulfilled customer need New technologies Loosening of regulations Changing of International trade barriers Business and product development <ul style="list-style-type: none"> Seasonal, weather, fashion influences Technology development and innovation Industry, for lifestyle trends 	Threats <ul style="list-style-type: none"> Environmental effects <ul style="list-style-type: none"> Seasonal, weather effects Economy - home, abroad Political effects Legislative effects Market demand <ul style="list-style-type: none"> New technologies, services, ideas IT developments Shifts in consumer tastes Obstacles <ul style="list-style-type: none"> Sustainable financial backing Insurmountable weaknesses Competitor intentions New regulations Increased trade barriers Emergence of substitute products

Internal	<ul style="list-style-type: none"> ✓ Your specialist marketing expertise. ✓ A new, innovative product or service. ✓ Location of your business. ✓ Quality processes and procedures. ✓ Any other aspect of your business that adds value to your product or service. 	<ul style="list-style-type: none"> ✓ Lack of marketing expertise. ✓ Undifferentiated products or services (i.e. in relation to your competitors). ✓ Location of your business. ✓ Poor quality goods or services. ✓ Damaged reputation.
External	Opportunities	Threats
	<ul style="list-style-type: none"> ✓ A developing market such as the Internet. ✓ Mergers, joint ventures or strategic alliances. ✓ Moving into new market segments that offer improved profits. ✓ A new international market. ✓ A market vacated by an ineffective 	<ul style="list-style-type: none"> ✓ A new competitor in your home market. ✓ Price wars with competitors. ✓ A competitor has a new, innovative product or service. ✓ Competitors have superior access to channels of distribution. ✓ Taxation is introduced on your