

Coffee

Emerging Health Effects and Disease Prevention

Yi-Fang Chu *EDITOR*



Press



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Yi-Fang Chu

Kraft Foods, Inc.

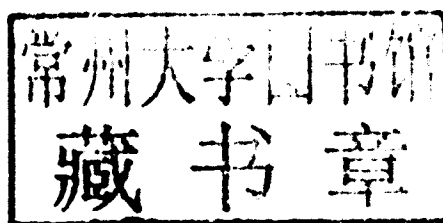


Press



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Preface

Coffee is a drink of acuity, of precision, of intellect. To truly understand this drink, one has to go back in time. Coffee was discovered in Ethiopia and brought to the Arab region in the sixteenth century. At that time in history, the Arab civilization was carrying the world forward. For example, they invented zero, which gave to the world elegant solutions to mathematical problems. It is no surprise that the region became fascinated with coffee, a drink that stimulated its penchant for precision and intellect.

Coffee was brought to Western Europe in the seventeenth century. At that time, most of Europe was often mildly drunk. Why? Because if you lived in London or Paris, you could not drink water from various sources without worries about water-borne diseases. Instead of a coffee break at 10 o'clock in the morning, people would have a "beer break." Paintings and literature from that era depict people's amusingly besotted behaviors throughout the whole day. Coffee drinking slowly replaced this practice. As the industrial revolution started to take shape in that region, workers simply could not afford to be drunk while operating heavy industrial machines. Coffee was the perfect solution to help fuel the revolution. Work and coffee grew inseparable in the modern age. Perhaps coffee makes the age possible at all. Now as we have moved into the twenty-first century, coffee is the world's most popular drink after water. It is a daily comfort to millions and a necessity to many more.

In consumers' minds, coffee is also often considered a guilty pleasure. At the turn of the twenty-first century, scientific tools started to become powerful enough to enable the discovery of what was previously deemed undiscoverable. Surprisingly, consumption of this indulgent drink began to show links to positive health impacts. As scientists continue to dig deeper, reports of good news about coffee constantly outweigh negative or neutral findings. In this book, we summarize the evolving state of the science related to coffee's health implications.

This book is divided into three main parts: (i) background and chemistry in Chapters 1–3, (ii) potential benefits in Chapters 4–13, and (iii) potential concerns in Chapters 14–18. We aim to be fair, objective, and evidence based. We are blessed with terrific contributions from a diverse group of experts from 12 different coffee-loving countries. Our ultimate goal is to refresh dialogue and intellectual debate about coffee's impacts on health, hopefully leading to better understanding collectively. On a personal level, we hope that this book can provide some useful information and eventually make you look at your daily cup just a bit differently. Who knows? Maybe, there really is more to coffee than just the ability to keep us awake!

Yi-Fang Chu

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List of Abbreviations

3-APA	3-Amino-propionamide
3MS	Modified Mini-Mental State Examination
ABCA1	ATP-binding cassette transporter A1
ACh	Acetylcholine
AChE	Acetylcholinesterase
AD	Alzheimer's disease
AFB1	Aflatoxin B1
ALT	Alanine aminotransferase
APOE	Apolipoprotein E
APP	Amyloid precursor protein
ARCAGE	Alcohol-Related Cancers and Genetic Susceptibility in Europe
ARE	Antioxidant response element
AST	Aspartate aminotransferase
AUB	Area under baseline
BACE	β -Amyloid precursor cleaving enzyme
BDA	Butene-1,4-dial
BMDL	Benchmark dose lower confidence limit
BMI	Body mass index
CA	Caffeic acid
CAIDE Study	Cardiovascular Risk Factors, Aging and Dementia Study
CAMP	Cyclic adenosine monophosphate
CASI	Cognitive Abilities Screening Instrument
CCl4	Carbon tetrachloride
CCR	Cytochrome-c-reductase
CEN	European Committee for Standardization
CGA	Chlorogenic acid
CHD	Coronary heart disease
ChEI	Cholinesterase inhibitor
CI	Confidence interval
CIAA	Confederation of the European Food and Drink Industry
Cmax	Peak plasma concentration
COMT	Catechol-O-methyltransferase
CPT	Cyclopentyltheophylline
CQA	Caffeoylquinic acid
CQAL	Caffeoylquinic acid lactone
CREB	cAMP response element-binding protein
CRP	C-reactive protein
CTGF	Connective tissue growth factor
CVD	Cardiovascular disease

CVS	Cardiovascular system
diCQA	Dicaffeoylquinic acid
DIFEQ	Derivative 3,4-diferuloyl-1,5-quinolactone
Disorders and Stroke	Alzheimer's Disease and Related Disorders Association
DPCPX	Dipropylxanthine
DRI	Dietary reference intake
DSM	Diagnostic and Statistical Manual of Mental Disorders
ECM	Extracellular matrix
EFSA	European Food Safety Authority
EGFR	Epithelial growth factor receptor
ERK	Extracellular signal-regulated protein kinase
EU	European Union
FBOs	Food business operators
FDA	Food and Drug Administration
FDE	FoodDrinkEurope
FQA	Feruloylquinic acid
FINE Study	Finland, Italy and The Netherlands Elderly Study
GABA	γ -Aminobutyric acid
GC-MS	Gas chromatography-mass spectrometry
GDNF	Glial-derived neurotrophic factors
GERD	Gastroesophageal reflux
GFP	Green fluorescent protein
GGT	γ -Glutamyl transferase
GIP	Insulin-like polypeptide
GLP-1	Glucagon-like peptide 1
GPD	Gastric potential difference
GST	Glutathione-S-transferase
HCC	Hepatocellular carcinoma
HDLs	High-density lipoproteins
HPA	Hypothalamic-pituitary-adrenal
HPLC-MSn	High-performance liquid chromatography mass spectrometry ion scan
HR	Hazard ratio
HRT	Hormone replacement therapy
hsCRP	High-sensitivity C-reactive protein
HSCs	Hepatic stellate cells
HT	Hydroxytryptophan
IARC	International Agency for Research on Cancer
IC50	Half-maximal inhibitory concentration
IDC	Instant decaffeinated coffee
IL	Interleukin
INF- γ	Interferon- γ
IR	Irritation index
IRMM	Institute for Reference Materials and Measurements
IVGTT	Intravenous glucose tolerance test
JECFA	Joint Food and Agriculture Organization/World Health Organization Expert Committee on Food Additives

JNK	c-Jun <i>N</i> -terminal kinase
LC-MS/MS	Liquid chromatography tandem mass spectrometry
LDL	Low-density lipoprotein
LES	Lower esophageal sphincter
LMP	Last menstrual period
LXR α	Liver X receptor- α
MAO	Human monoamine oxidase
MAPK	Mitogen-activated protein kinase
MAPT	Microtubule-associated protein tau
MMSE	Mini-Mental State Examination
MOE	Margin of exposure
MOS	Mannooligosaccharides
MPTP	1-Methyl-4-phenyl-1,2,3,6-tetrahydropyridine
MRI	Magnetic resonance imaging
MWM	Morris water maze
NF- κ B	Nuclear factor- κ B
NINCDS-ADRDA	National Institute of Neurological and Communicative
NMDAR	<i>N</i> -Methyl-D-aspartate receptor
NMP	<i>N</i> -Methylpyridinium
NOAEL	No observed adverse effect level
NSAIDs	Nonsteroidal anti-inflammatory drugs
NTP	National Toxicology Program
NVP	Nausea and vomiting in pregnancy
OGTT	Oral glucose tolerance test
OR	Odds ratio
ORAC	Oxygen radical absorbance capacity
OTA	Ochratoxin A
PAH	Polycyclic aromatic hydrocarbon
PD	Parkinson's disease
PGA	Pyroglutamate
PKA	Protein kinase A
PS	Presenilin
RAWM	Radial-arm water maze
RCT	Reverse cholesterol transport
ROS	Reactive oxygen species
RR	Relative risk
RR	Risk ratio
SCAA	Specialty Coffee Association of America
SD	Standard deviation
SR-BI	Scavenger receptor class B type I
TGF	Transforming growth factor
TICS	Telephone Interview for Cognitive Status
T _{max}	Time reached for peak plasma concentration
TNF- α	Tumor necrosis factor alpha
TRAP	Total radical-trapping antioxidant parameters
VLDL	Very low-density lipoprotein
WCRF	World Cancer Research Fund

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Contents

<i>Preface</i>	xvii
<i>List of Contributors</i>	xix
<i>List of Abbreviations</i>	xxii
<i>Acknowledgement</i>	xxv
1 Introduction	1
Thomas Hatzold	
1.1 Coffee—a popular beverage	1
1.2 Coffee from a nutritional perspective	1
1.3 Potential beneficial effects of coffee	2
1.4 Limitations to the beneficial effects	3
1.5 History	5
1.6 Coffee production worldwide	5
1.7 Coffee processing: formation and fate of bioactive compounds	5
1.7.1 Green bean processing, storage, and transport	6
1.7.2 Blending	8
1.7.3 Roasting	8
1.7.4 Grinding	10
1.7.5 Packaging and storage	10
1.7.6 Decaffeination	10
1.7.7 Soluble coffee production	10
1.8 New processes to optimize the health benefits of coffee	10
1.8.1 Enhancement with mannoooligosaccharides	11
1.8.2 Use of green bean extracts	11
1.8.3 After-roast blending for enhanced antioxidative properties	11
1.8.4 Stomach-friendly coffee	12
1.9 Coffee preparation	12
1.9.1 Boiled coffee	13
1.9.2 Cafetière or French press coffee	13
1.9.3 Filter coffee	13
1.9.4 Espresso	13
1.9.5 Moka (mocha)	13
1.9.6 Percolated coffee	13
1.9.7 Soluble coffee	13
1.9.8 Liquid coffee	13
1.9.9 Single-serve coffee machines	14
1.10 Coffee beverages and specialties	14
1.11 Coffee consumption	14

1.12	Conclusions	16
	Acknowledgments	16
	References	17
2	Coffee Constituents	21
	Adriana Farah	
2.1	Introduction	21
2.2	Production of coffee and coffee-based beverages	22
2.2.1	Green coffee production	22
2.2.2	Decaffeinated coffee production	23
2.2.3	Steam-treated and monsooned coffees	24
2.2.4	Coffee roasting	24
2.2.5	Coffee brewing	25
2.2.6	Instant coffee production	26
2.3	Natural coffee constituents	26
2.3.1	Green coffee chemical composition	27
2.3.1.1	Nonvolatile compounds in green coffee	27
	Caffeine	28
	Trigonelline	29
	Chlorogenic acids	30
	Cafestol and kahweol	31
	Soluble dietary fiber	32
	Water	33
	Carbohydrates	33
	Protein, peptides, and free amino acids	33
	Minerals	33
	Lipids	34
2.3.1.2	Volatile compounds in green coffee	34
2.3.2	Changes in coffee chemical composition during roasting	35
2.3.2.1	Nonvolatile components in roasted coffee	35
2.3.2.2	Volatile compounds in roasted coffee	37
2.3.3	Changes in coffee chemical composition during special coffee processing	39
2.3.4	Chemical composition of coffee brew	41
2.4	Incidental coffee constituents	43
2.4.1	Incidental nonvolatile compounds in coffee	43
2.4.1.1	Ochratoxin A	43
2.4.1.2	Biogenic amines	44
2.4.1.3	β -carbolines	45
2.4.1.4	Acrylamide	46
2.4.1.5	Polycyclic aromatic hydrocarbons	47
2.4.1.6	Pesticide residues	48
2.4.2	Incidental volatile constituents in coffee	48
2.5	Concluding remarks	50
	Acknowledgments	50
	References	50

3 Bioavailability of Coffee Chlorogenic Acids	59
Angélique Stalmach	
3.1 Introduction	59
3.2 Chlorogenic acids: contribution of coffee to dietary levels ingested	59
3.2.1 Dietary intake	59
3.2.2 Levels in coffee beverage	61
3.3 Bioavailability of coffee chlorogenic acids	62
3.3.1 Absorption and metabolic fate	62
3.3.2 Extensive metabolism upon intake	62
3.3.2.1 Identification of chlorogenic acid metabolites	62
3.3.2.2 Metabolic pathways	62
3.3.2.3 Bioavailability of intact chlorogenic acids	68
3.3.3 Urinary and biliary excretion	71
3.3.4 Effects of food matrix and co-ingestion on bioavailability	71
3.4 Conclusions	72
References	73
4 Coffee and Alzheimer's Disease: Animal and Cellular Evidence	77
Marshall G. Miller and Barbara Shukitt-Hale	
4.1 Introduction	77
4.2 Alzheimer's disease	77
4.2.1 Prevalence	77
4.2.2 Symptoms	78
4.2.3 Gross pathology	78
4.2.4 Tauopathy	78
4.2.5 Cerebral amyloidosis	78
4.2.6 Other neuropathology	79
4.2.7 Genetic factors	79
4.2.8 Diagnosis	80
4.2.9 Treatments	80
4.2.10 Cellular and animal models of Alzheimer's disease	80
4.3 Coffee	81
4.3.1 Cellular evidence	81
4.3.2 Animal evidence	82
4.4 Caffeine	82
4.4.1 Cellular evidence	83
4.4.2 Animal evidence	83
4.5 Phenolics	86
4.5.1 Cellular evidence	86
4.5.2 Animal evidence	87
4.5.3 Caffeic acid	88
4.5.4 Dicinnamoylquinides	89
4.6 Other coffee constituents	89
4.6.1 Trigonelline	89
4.6.2 Kahweol and cafestol	90
4.6.3 Pyroglutamate	91