



**MUSHROOM  
CULTIVATION  
BUSINESS  
AND  
MARKETING  
SECRECIES**



**ADRIAAN SMIT &  
MARKUS PETER-ERIK  
JANSSENS**



**Copyright, Legal Notice and Disclaimer:**

This publication is protected under the copyright act and all other applicable international, federal, state, provincial and local laws, and all worldwide rights are reserved, including resale rights. You are not allowed to give or sell this e-Book or a printout to anyone else. If you received this publication from anybody other than Cape Connoisseur Champignons (Pty) Ltd, you have received a pirated copy. Please contact us for support at [info@mushroomacademy.com](mailto:info@mushroomacademy.com) and notify us of the situation.

Also note that much of this publication is based on personal experience and research evidence. Although the authors and publisher have made every reasonable attempt to achieve complete accuracy of the content in this e-Book, they assume no responsibility for errors or omissions. Also, you should use this information as you see fit, and at your own risk. Your particular situation may not be exactly suited to the examples illustrated. In fact, it's likely that they would not be the same, and you should adjust your use of the information and recommendations accordingly.

All trademarks, service marks, product names or named features are assumed to be the property of their respective owners, and are used for reference only. There is no implied endorsement by using one of these terms.

Information in this e-Book is not intended to replace common sense, legal, medical or other professional advice, and is rather meant to inform and educate the reader.



ISBN: 978-0-620-73577-3

Copyright © 2017. Cape Connoisseur Champignons (Pty) Ltd, Cape Town. All worldwide rights reserved.

[www.mushroomacademy.com](http://www.mushroomacademy.com)  
[info@mushroomacademy.com](mailto:info@mushroomacademy.com)

## TABLE OF CONTENTS

**Substrate-based** (gourmet / exotic / specialty / medicinal mushroom) cultivation is very different when compared with **compost-based** (button) mushroom cultivation, especially when referring to health and environmental implications and cultivation procedures.

Some chapters will challenge compost-based mushroom producers, others deal with uncertainties substrate-based mushroom producers are usually confronted with. Most chapters e.g. pests / diseases, management and marketing topics are universal points of discussion and thus applicable to both type of industries.

Substrate + no microbial fermentation = Substrate

Substrate + microbial fermentation = Compost

Introduction .....	5
Designing the perfect substrate or compost .....	11
Inorganic enrichment options for organic production .....	12
Liebig's law of the minimum .....	13
Basic interrelationships in mineral nutrition .....	14
Potassium and other complicated interdependent nutrient relationships .....	15
Principles of infection / infestation as related to nutrition .....	16
Unit conversions .....	17
Total carbon, total nitrogen, organic nitrogen and the carbon:nitrogen ratio .....	18
Carbon:phosphorus ratio, electrical conductivity (EC) and the sodium absorption ratio (SAR) .....	19
Basic function of the individual macro- and micronutrients .....	20
The correct sterilisation procedure .....	21
Autoclave tape that changes colour in a steam environment as opposed to a dry environment .....	22
Thermo scientific biological indicators .....	23
Fungal enzymes to be optimised to ensure maximum mushroom yield.....	24
Psychrometrics.....	25
Transfer rate of minerals from substrate to the fruiting body .....	26
Sulphur, nitrogen and volatile fatty acids.....	27
Odour under aerobic versus anaerobic conditions.....	28
Ketones, aldehydes, alcohols, terpenes, esters, thiols, indoles and skatoles .....	29
Aerobic and anaerobic nature of bacteria .....	30
Risk factor associated with bacterial endospores .....	31
Bacterial endospore elimination via the tyndallisation effect.....	32
Aeration and the power of hydrogen (pH) .....	33

Microbial transformation of both organic and inorganic sulphur compounds .....	34
Hydrogen sulphide exposure limits at the workplace .....	35
Community hydrogen sulphide exposure limits .....	36
A major source of ammonia release is when the initial nitrogen content of phase I compost is too high in relation to the carbon i.e. a too low C:N ratio .....	37
Anaerobic organic matter is one of the major sources of odour .....	38
Ammonia exposure limits at the workplace .....	39
Health consequences when using hypochlorite in the presence of ammonia or acids .....	40
Community ammonia exposure limits .....	41
Environmental and legal requirements to emit the minimum harmful substances and odours .....	42
Greenhouse gas (GHG) emissions from composting .....	43
Nitrous oxide greenhouse gas (GHG) emissions .....	44
Methane greenhouse gas (GHG) emissions .....	45
Methane and nitrous oxide contribution towards the compost greenhouse gas (GHG) potential .....	46
Management practices to minimise methane and nitrous oxide greenhouse gas (GHG) emissions .....	47
Hypersensitivity pneumonitis .....	48
Particulate matter .....	49
Principal types of particulate matter of concern .....	50
Aerodynamic versus physical size of spores .....	51
Types of particulate aerosols .....	52
Exposure to biological particulate matter (bioaerosols) during the production and handling of mushroom compost .....	53
Mycophagous, predaceous and saprophagous nature of mites, nematodes and flies .....	54
Hypopus stage and phoretic and contaminative behaviour of mites .....	55
Physical barrier to prevent entry of sciarid, phorid, scatopsid and cecidomyiid flies .....	56
Entomopathogenic nematodes .....	57
Entomopathogenic bacteria .....	58
Biochemical mode of action of chemical classes of insecticides .....	59
Organophosphate and carbamate insecticides .....	60
Organochlorine pesticide toxicity .....	61
Pyrethroid and pyrazole insecticides, sterile males and pheromone disruptors .....	62
Insect growth regulators .....	63
Insecticide group and subgroup descriptors .....	64
Lethal dosage (LD) versus lethal concentration (LC) .....	65
Pesticide and fungicide resistance .....	66
Common sense pest avoidance strategy .....	67
The Trichoderma conundrum .....	68
Lag and subsequent exponential growth rate phase of bacteria .....	69

Bacteriophage treatment – the forgotten cure .....	70
People skills.....	73
First who then what .....	74
Renewal.....	75
Scenario planning and thought experimentation .....	76
Social capital .....	77
Personalities.....	78
Indispensable choleric personality traits .....	79
Dear choleric .....	80
Sunny sanguine personalities .....	81
Dear sanguine .....	82
Pleasant phlegmatic personality traits .....	83
Dear phlegmatic.....	84
Meticulous melancholy personality traits .....	85
Dear melancholy .....	86
There’s a choleric in my mushroom business.....	87
Screening recruits .....	88
Employee engagement .....	89
Create the culture of your organisation .....	90
Your blind spot.....	91
Assess your personal effectiveness .....	92
Assess your impact on your organisation’s climate.....	93
Affirm the best in people .....	94
Recognition .....	95
Discernment.....	96
Personal and professional development .....	97
Habits .....	98
Build and sustain trust .....	99
The ladder of inference.....	100
Affirmations .....	101
Business etiquette.....	102
Designing your operation.....	103
Systems thinking .....	104
Strategic financial management .....	105
Operational financial management .....	106
Cash flows .....	107
Systems .....	108
Practical use of statistics .....	109

Exponential growth.....	110
Your target audience.....	111
The four P's of your marketing campaign.....	112
Pricing.....	113
Sustainable promotion strategy .....	114
Competitive analysis .....	115
Social media monitoring .....	116
Aesthetics, presentation, style and taste .....	117
Sales process .....	118
Selling.....	119
Decision-making.....	120
Accountability, coaching and feedback .....	121
Annotated bibliography .....	122
Index.....	128