

*The*  
**Mushroom  
Business  
Design**  
*Guide*

The Art of Building Your Enterprise



**ADRIAAN SMIT *PHD* &**  
**MARKUS PETER-ERIK JANSSENS *MBA, MSc***

*Authors of Mushroom Cultivation Business and Marketing Secrecies*



**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: 978-0-620-78648-5

Copyright © 2019. 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 EXPLANATION

### BUSINESS DESIGN INCLUDING SUBSTRATE AND SYSTEM DESIGN

#### SUBSTRATE DESIGN

##### Section One

**If you don't understand substrate design, either somebody else controls your business or you don't have a profitable business.** To get maximum use of the *Mushroom Substrate Design Calculator*<sup>®</sup>, we have compiled this *Mushroom Business Design Guide*<sup>®</sup> which will explain the value of the calculator with examples and substrate formulations applicable to various mushroom species.

#### SYSTEM DESIGN

##### Section Two

Additional emphasis will be on the know-how to structure or design your mushroom business in such a manner that you can operate at optimum levels for maximum profitability. This section will teach you how to set up, use and interpret the *Mushroom Business Plan and Operational Management Design System*<sup>®</sup> to **track and manage all aspects of your commercial operation**. This fully operational system can be purchased from the publisher.

#### PUBLISHER

Cape Connoisseur Champignons (Pty) Ltd t/a SA Gourmet Mushroom Academy<sup>®</sup>  
Head Office Site Location: City of Cape Town  
E-mail: [info@mushroomacademy.com](mailto:info@mushroomacademy.com)  
[www.mushroomacademy.com](http://www.mushroomacademy.com)

## TABLE OF CONTENTS

Introduction .....	7
Mushroom Substrate Design Calculator® .....	13
Nitrogen, Carbon and Moisture Content Percentages of Individual Potential Substrate Ingredients .....	14
Biodegradation of Lignin .....	15
Nitrogen, Carbon and Moisture Content Percentages of Individual Potential Supplements.....	16
Aflatoxins associated with Peanut Meal .....	17
The Optimum Carbon:Nitrogen Ratio .....	18
The Optimum Nitrogen Percentage.....	19
Nitrogen Percentage and Water Absorption Ratio of Grains .....	20
Red Sorghum Grain Spawn Preparation .....	21
Moisture Content, Temperature and Equilibrium Relative Humidity associated with Safe Storage of Grains .....	22
C:N Ratio and Nitrogen Percentage of Different Main Ingredient and Supplement Combinations.....	23
Wood-Based Substrate Supplemented with Cottonseed Cake for Shiitake Cultivation .....	26
Wood-Based Substrate Supplemented with Spent Brewer’s Grain for Shiitake Cultivation.....	27
Wood-Based Substrate Supplemented with Wheat Bran for Shiitake Cultivation.....	28
Straw-Based Substrate Supplemented with Cottonseed Cake for Shiitake Cultivation .....	29
Straw-Based Substrate Supplemented with Spent Brewer’s Grain for Shiitake Cultivation .....	30
Straw-Based Substrate Supplemented with Wheat Bran for Shiitake Cultivation .....	31
Wood-Based Substrate Supplemented with Cottonseed Cake for King Oyster Cultivation.....	32
Wood-Based Substrate Supplemented with Spent Brewer’s Grain for King Oyster Cultivation .....	33
Wood-Based Substrate Supplemented with Wheat Bran for King Oyster Cultivation.....	34
Straw-Based Substrate Supplemented with Cottonseed Cake for King Oyster Cultivation .....	35
Straw-Based Substrate Supplemented with Spent Brewer’s Grain for King Oyster Cultivation .....	36
Straw-Based Substrate Supplemented with Wheat Bran for King Oyster Cultivation .....	37
Wood-Based Substrate Supplemented with Cottonseed Cake for Pink, Golden and Tree Oyster Cultivation .....	38
Wood-Based Substrate Supplemented with Spent Brewer’s Grain for Pink, Golden and Tree Oyster Cultivation .....	39
Wood-Based Substrate Supplemented with Wheat Bran for Pink, Golden and Tree Oyster Cultivation .....	40
Straw-Based Substrate Supplemented with Cottonseed Cake for Pink, Golden and Tree Oyster Cultivation .....	41
Straw-Based Substrate Supplemented with Spent Brewer’s Grain for Pink, Golden and Tree Oyster Cultivation .....	42
Straw-Based Substrate Supplemented with Wheat Bran for Pink, Golden and Tree Oyster Cultivation .....	43
Disadvantages and Advantages of Pasteurisation via the Boiling Process .....	44

System Overview .....	50
Spawn Run .....	51
Cultivation Cycle .....	52
Excel-based System Design.....	53
System Diagram – Reference.....	54
System Diagram – Substrate Formulation .....	55
System Diagram – Spawn Run Tables .....	56
System Diagram – Spawn Run Tables (cont.).....	57
System Diagram – Cultivation Tables.....	58
System Diagram – Cultivation Tables (cont.).....	59
System Diagram – Financial Tables.....	60
Simple Excel Formulas .....	61
Settings.....	62
Table Specification – Ingredient Analysis .....	63
Table Specification – Substrate Formulation.....	64
Table Specification – Substrate Mixture.....	65
Table Specification – Substrate Mixture (cont.) .....	66
Table Specification – Species Strain.....	67
Table Specification – Spawn Run Room.....	70
Table Specification – Spawn Run Cycle.....	71
Table Specification – Spawn Run Cycle (cont.) .....	72
Table Specification – Spawn Run Cycle (cont.) .....	73
Table Specification – Spawn Run Cycle (cont.) .....	74
Table Specification – Spawn Run Cycle (cont.) .....	75
Table Specification – Spawn Run Cycle (cont.) .....	76
Table Specification – Spawn Run Room Movement.....	77
Table Specification – Spawn Run Room Data Actual .....	78
Table Specification – Spawned Substrate Cold Storage .....	79
Table Specification – Cultivation Room .....	80
Table Specification – Cultivation Specification .....	81
Table Specification – Cultivation Cycle .....	82
Table Specification – Cultivation Cycle (cont.).....	83
Table Specification – Cultivation Cycle (cont.).....	84
Table Specification – Cultivation Cycle (cont.).....	85
Table Specification – Cultivation Cycle (cont.).....	86
Table Specification – Cultivation Cycle (cont.).....	87
Table Specification – Cultivation Cycle (cont.).....	88
Table Specification – Cultivation Cycle (cont.).....	89

Table Specification – Cultivation Room Movement .....	90
Table Specification – Cultivation Room Movement (cont.) .....	91
Table Specification – Cultivation Room Data Actual.....	92
Table Specification – Cultivation Room Data Actual.....	93
Table Specification – Cultivation Room Data Actual.....	94
Table Specification – Cultivation Room Flush .....	95
Table Specification – Invoice and Credit Note .....	96
Table Specification – Invoice and Credit Note (cont.) .....	97
Table Specification – Cost .....	98
Table Specification – Asset .....	99
Table Specification – Master Lists.....	100
Table Snapshot of Ingredient Analysis.....	101
Snapshots of the Substrate Mixture Table .....	102
Snapshot of the Substrate Formulation Table .....	103
Snapshots of the Species Strain Table .....	104
Snapshot of the Supplier Table .....	105
Snapshot of the Spawn Run Room Table.....	106
Snapshots of the Spawn Run Cycle Table .....	107
Snapshots of the Spawn Run Cycle Table (cont.).....	108
Snapshot of the Spawn Run Cycle Table (cont.) .....	109
Snapshot of the Spawn Run Room Movement Table .....	110
Snapshot of the Spawn Run Room Data Actual Table .....	111
Snapshot of the Spawned Substrate Cold Storage Table .....	112
Snapshot of the Cultivation Room Table .....	113
Snapshot of the Cultivation Specification Table .....	114
Snapshots of the Cultivation Cycle Table.....	115
Snapshots of the Cultivation Cycle Table (cont.) .....	116
Snapshot of the Cultivation Room Movement Table .....	117
Snapshot of the Cultivation Room Movement Table (cont.).....	118
Snapshots of the Cultivation Room Data Actual Table .....	119
Snapshot of the Cultivation Room Data Actual Table (cont.) .....	120
Snapshot of the Cultivation Room Flush Table.....	121
Snapshot of the Customer Table .....	122
Snapshot of the Invoice Table.....	123
Snapshot of the Cost Type Table .....	124
Snapshots of the Asset Class and VAT Rate Table .....	125
Snapshot of the Cost Table .....	126
Snapshot of the Cost Table (cont.).....	127

Snapshot of the Asset Table .....	128
Operational VAT Report.....	129
Asset Ratio Report .....	130
Data Model Measures and Pivot Tables .....	131
Performance Measures for the Spawn Run and Cultivation Cycle .....	132
Biological Efficiency %.....	133
Biological Efficiency % Scenarios .....	134
Annotated Bibliography .....	136
Index.....	139