

Contents

1	Introduction	1
1.1	Background and Objectives	1
1.2	Animal-Based Monitoring	2
1.3	A Selection of Parameters	2
1.4	Organization of the Handbook	5
2	Grouping Demographic Data	7
2.1	Cohort Splitting	8
2.1.1	Horizontal and Vertical Cells	8
2.1.2	Aggregation of Cells	10
2.2	Pseudo-cohort Splitting	10
2.2.1	Columns of Cells	10
2.2.2	Other Types of Cells	12
3	Mortality and Offtake Rates	13
3.1	One Type of Removal	14
3.1.1	Probabilistic Models	14
3.1.2	Calculations Over Subperiods	16
3.1.3	Mean Size Approximation	19
3.2	Case with Two Types of Removal	20
3.2.1	Crude Probabilities	20
3.2.2	Hazard Rates	21
3.2.3	Relations Between Crude Probabilities and Hazard Rates	22
3.2.4	Competing Risks and Interferences	22
3.2.5	Corrected Probability of Death	25
3.3	Additional Points	27
3.3.1	Calculations with Intake	27
3.3.2	Non-constant Rates	28
3.3.3	Case with More Than Two Types of Events	31

4 Other Demographic Rates	33
4.1 Reproduction Rates	33
4.1.1 Parturition and Abortion Rates	33
4.1.2 Prolificacy, Stillbirth and Female-at-Birth Rates	37
4.2 Synthetic Rates	37
4.3 Global Demographic Rates	38
4.3.1 Herd Dynamics	38
4.3.2 Production	38
5 Package Laserdemog	41
5.1 R Software	41
5.2 Functions in Laserdemog	41
5.2.1 Data Importation	42
5.2.2 Data Splitting	43
5.2.3 Calculation of the Parameters	46
5.3 Additional Points	48
5.3.1 Arguments <code>ini</code> and <code>end</code>	48
5.3.2 Codes for Exits and Entries	49
5.3.3 Global Dynamics and Production Rates	49
6 Numerical Examples	53
6.1 Example 1 – Overall Description	53
6.1.1 Data Importation and Splitting	54
6.1.2 Herd Sizes and Structures	56
6.1.3 Demographic Rates	61
6.2 Example 2 – More on Reproduction Rates	70
6.3 Example 3 – Test of a Treatment on Mortality	76
6.3.1 Data Importation and Splitting	76
6.3.2 Descriptive Analysis of the Treatment Effect	77
6.3.3 Test of the Treatment Effect	80
7 Annexes	87
7.1 Rates p and h in Survival Analyses	87
7.1.1 One Cause of Removal	87
7.1.2 Two Causes of Removal	89
7.2 R Materials	90
7.3 Structure of Tables Generated by <code>hsplit</code> and <code>vsplit</code>	91
References	95

Calculation of Demographic Parameters in Tropical
Livestock Herds

A discrete time approach with LASER animal-based
monitoring data

Lesnoff, M.; Lancelot, R.; Moulin, C.-H.; Messad, S.;
Juanès, X.; Sahut, C.

2014, X, 99 p. 33 illus., 23 illus. in color., Hardcover
ISBN: 978-94-017-9025-3