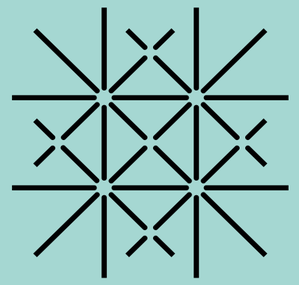


University
of Basel

In association with:

Swiss TPH

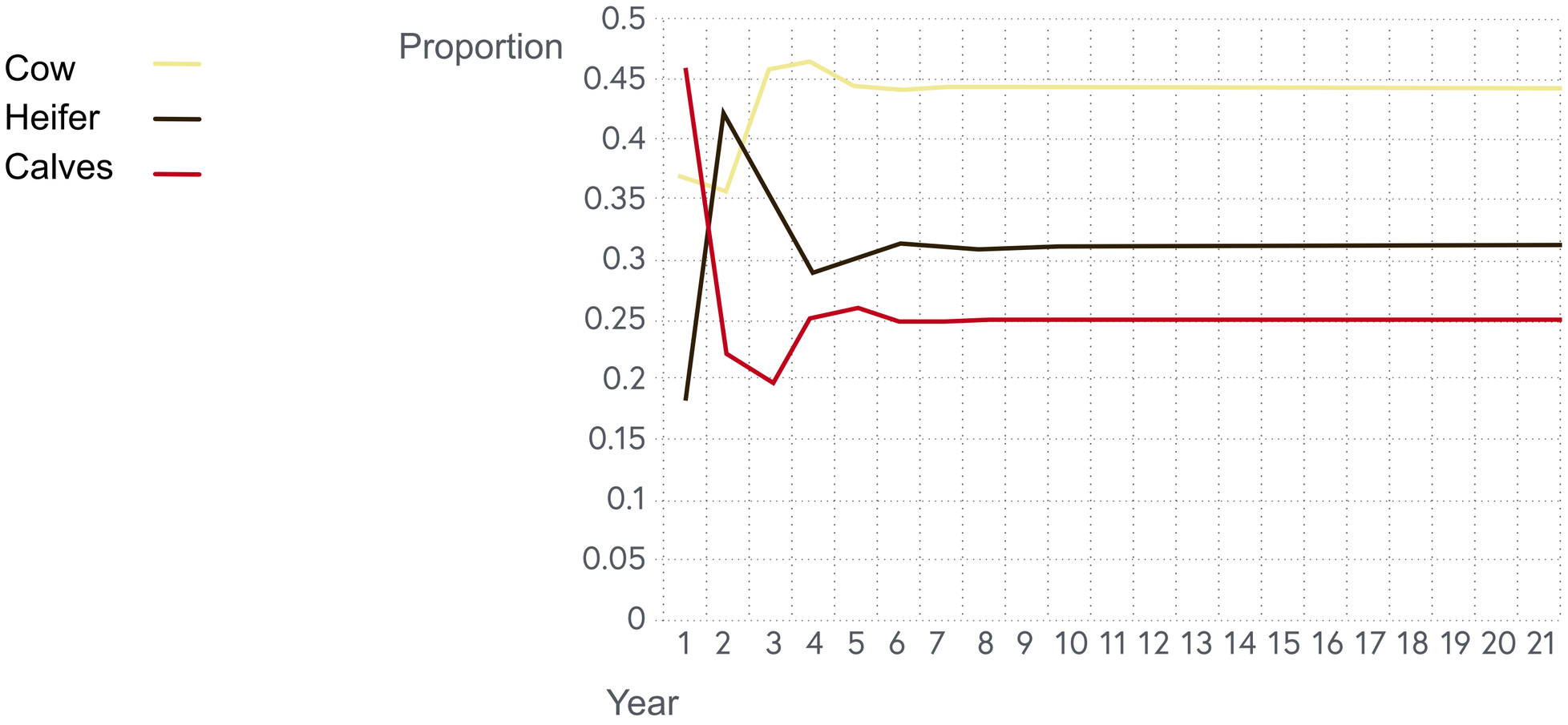
Swiss Tropical and Public Health Institute
Schweizerisches Tropen- und Public Health-Institut
Institut Tropical et de Santé Publique Suisse

Solving the formula
(part two)

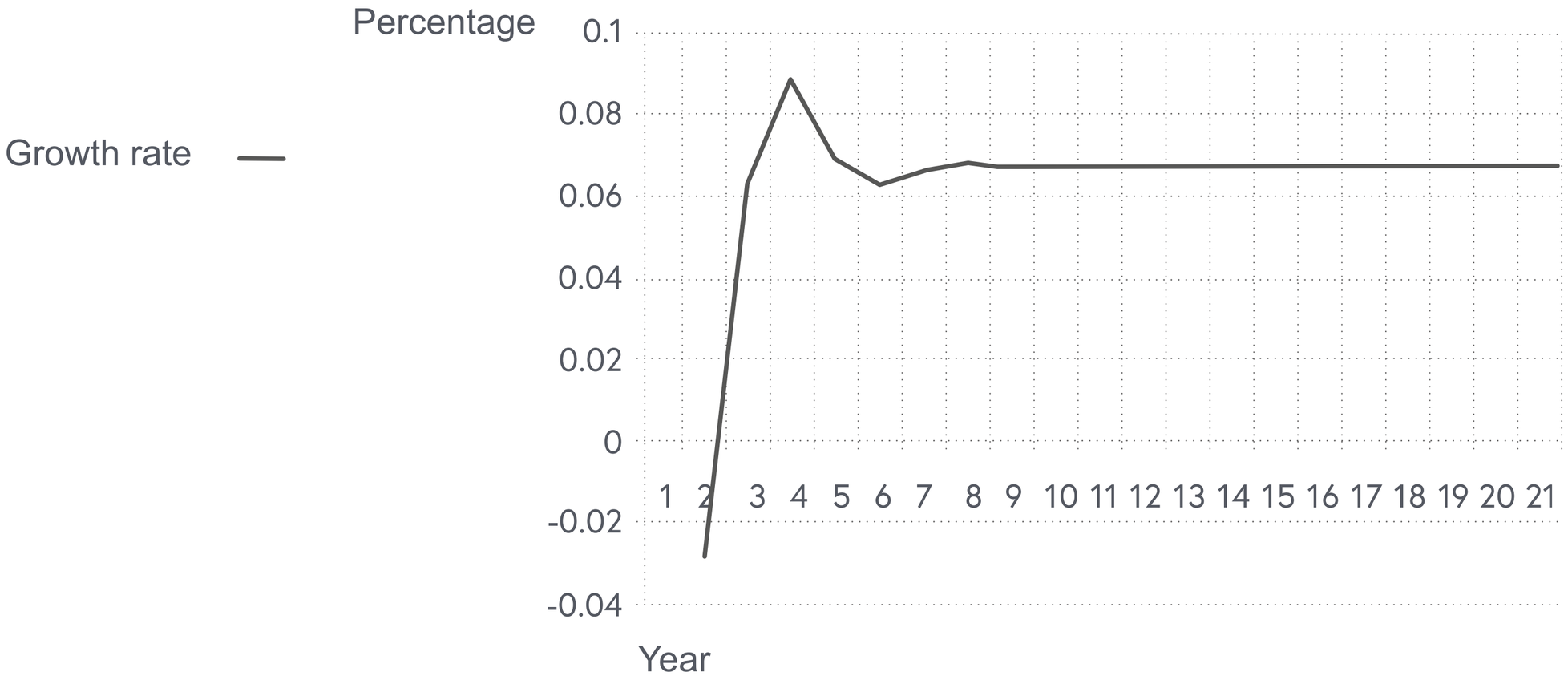
Solution: 20 years

	P0	Time intervals			.....			
Population vector	0	1	2	3	17	18	19	20
Calves	50000	24000	22800	31020	143	81227	86652	92439
Heifers	20000	45000	39300	35610	039	100319	107019	114166
Cows	40000	38000	51700	57185	379	144420	154065	164353
Total population	110000	107000	113800	123815	561	325967	347736	370958
Eigenvalue		0.9727273	1.0635514	1.0880053	1.(819	1.0667818	1.0667819	1.066782
Normed Eigenvector								
Calves	0.4545455	0.2242991	0.2003515	0.2505351	0.2 897	0.2491893	0.2491893	0.2491893
Heifers	0.1818182	0.4205607	0.3453427	0.2876065	0. 594	0.3077597	0.3077596	0.3077595
Cows	0.3636364	0.3551402	0.4543058	0.4618584	0.4 051	0.443051	0.4430512	0.4430512

Plots of normed eigenvector and eigenvalue



Growth rate


Percentage
Growth rate
0.1
0.08
0.06
0.04
0.02
0
-0.02
-0.04
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
Year

Population growth

Total population

$$P_t = P_0 e^{\lambda t}$$