



Role of human labour in relation to efficiency and effectiveness, with particular regard to small-scale farms

PD Dr. habil. Matthias Schick



Aim of the keynote

- 1. Methodical approach**
 - efficiency / effectiveness
 - increasing efficiency
- 2. Comparison work science**
 - Animal Husbandry (dairy cattle)
- 3. Weak point analysis and optimization ideas**

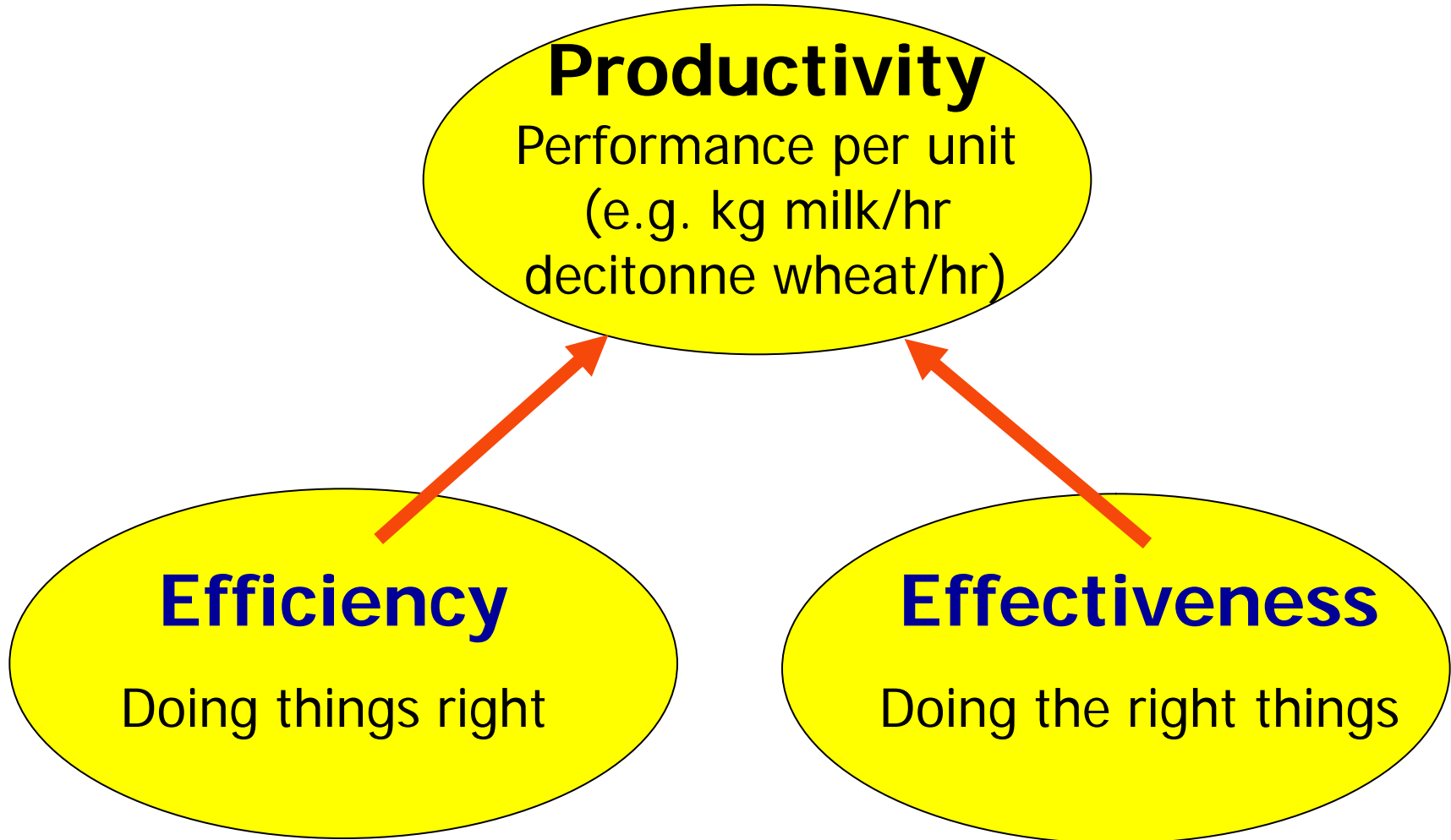


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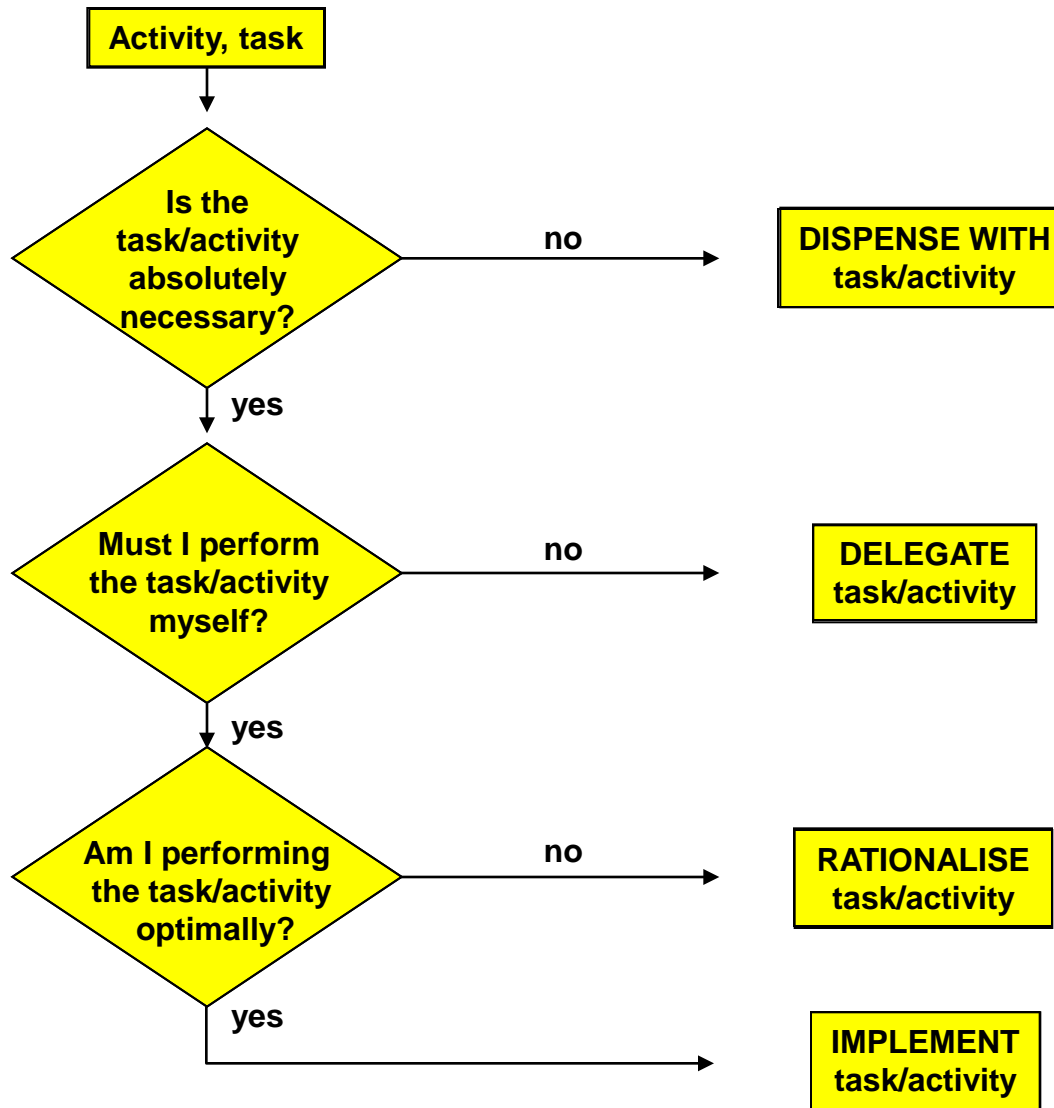


Future of research in agricultural systems technology and in the agricultural sector





Work analysis = Weakness analysis = Rationalisation



Source: REFA, 1984



Key figures in international comparison

	surface [ha LF]	dairy cows [n]	milk yield [kg]	time requir./cow [MPh]	work persons (requir.) [MP ₂₈₀₀]	work persons (requir.) [MP ₂₂₀₀]	work persons (offer) [MP]	labor productivity [kg/MPh]
Switzerland	21.5	21.2	6773	109	1.01	1.29	2.8	62
Denmark	53.7	101.4	8323	40	1.92	2.45	1.9	208
Germany	43.7	40.3	6944	78	1.50	1.91	2.5	90
Spain	23	26.1	6700	98	1.12	1.42	2	68
France	48.6	41	6381	77	1.55	1.98	2	83
Austria	19.1	10.5	5935	149	0.72	0.92	2.5	40
Great Britain	55.6	69.4	7175	55	1.84	2.34	2.2	132
EC-25	11.9	16.6	6350	122	0.83	1.05	2	52

Sources: Statistisches Lexikon der Schweiz, 2009; EUROSTAT 2009; Agrarmärkte 2009; Statistisches Jahrbuch DE 2009; Eurostat, 2009
Data per farm

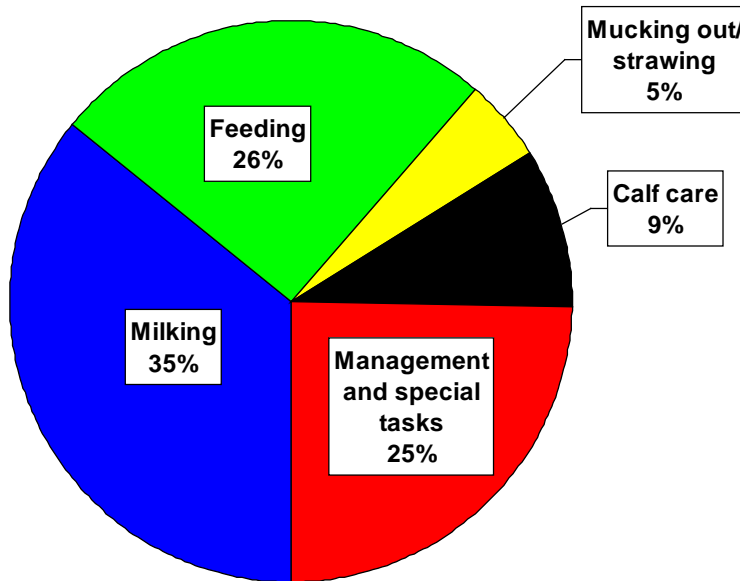


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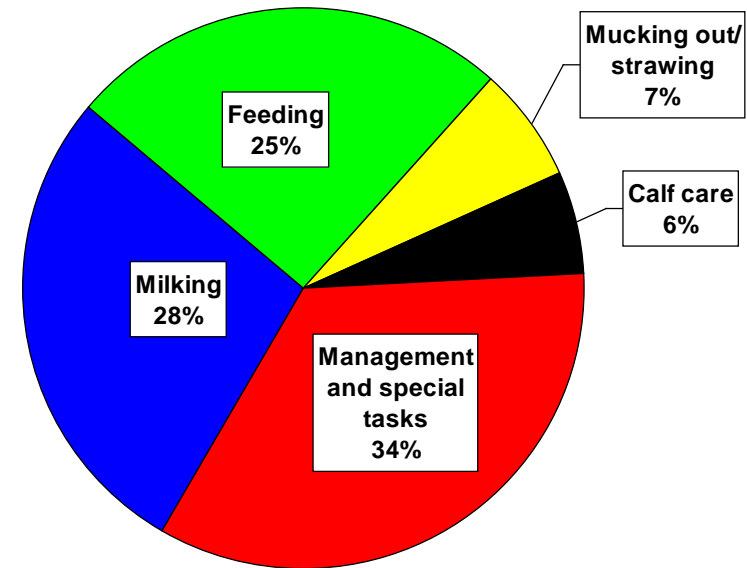


Working time requirements dairy farm



Production system:
Loose housing, horizontal silo, 8000 kg

Time requirement per cow per year:
62 MPH (n = 60)
Total work: 3720 MPh



Production system:
Loose housing, horizontal silo, 8000 kg

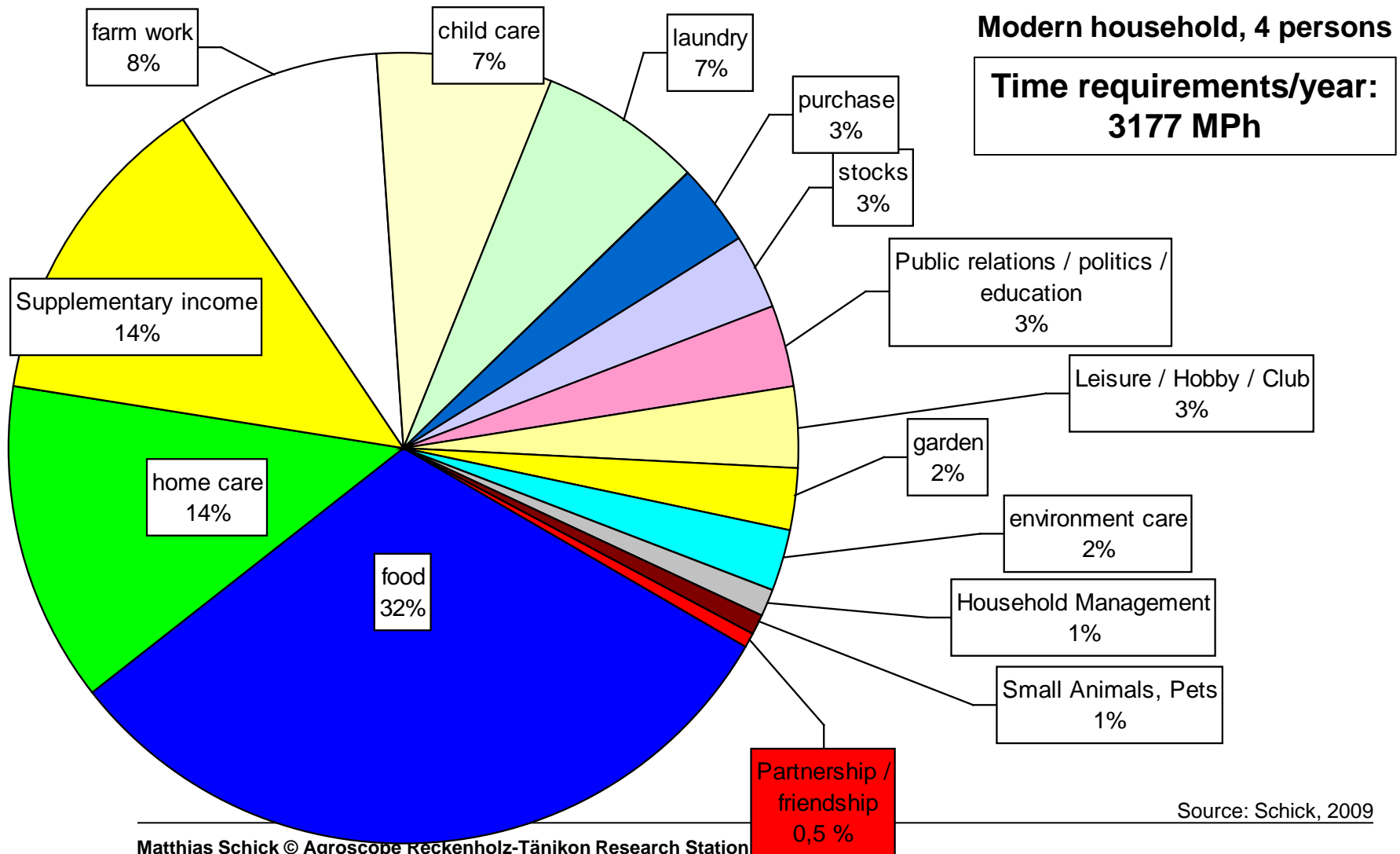
Time requirement per cow per year:
43 MPH (n = 180)
Total work: 7740 MPh

Source: Schick, 2008



Working time requirements farm women

Relative proportions of the individual works in the total time requirement

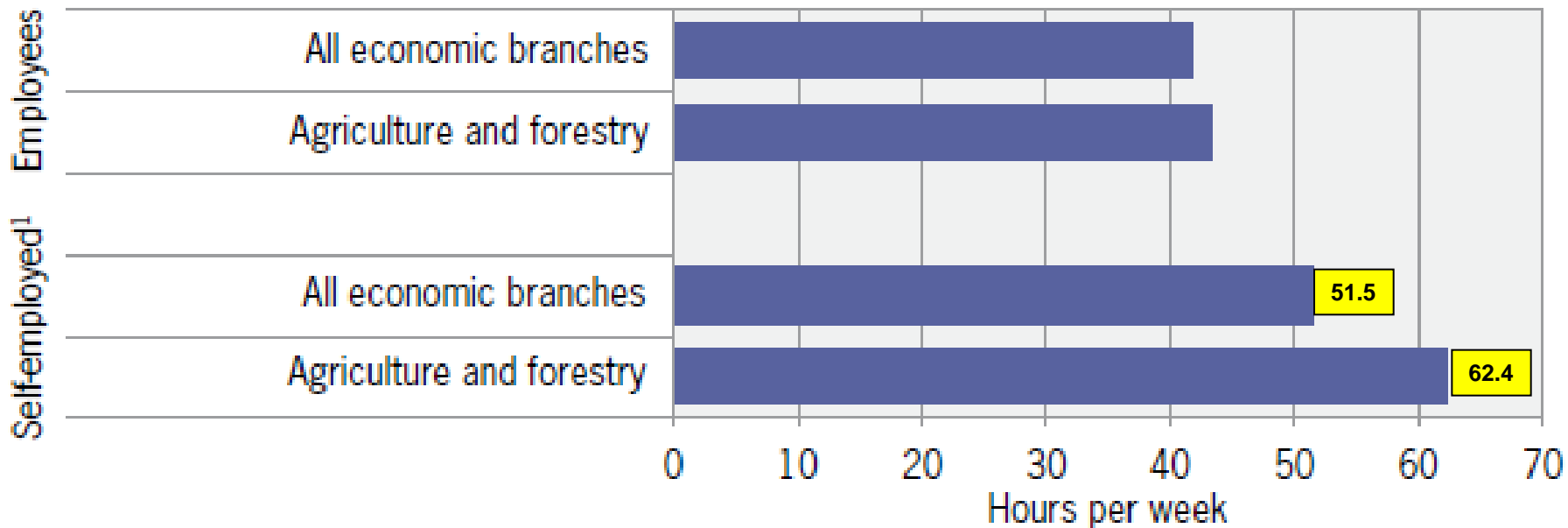


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Human labour: efficiency - effectiveness

Source: Schick, 2009



Working in Switzerland I



¹ Including self-employed people and employees in their own company (joint stock company and limited-liability company).

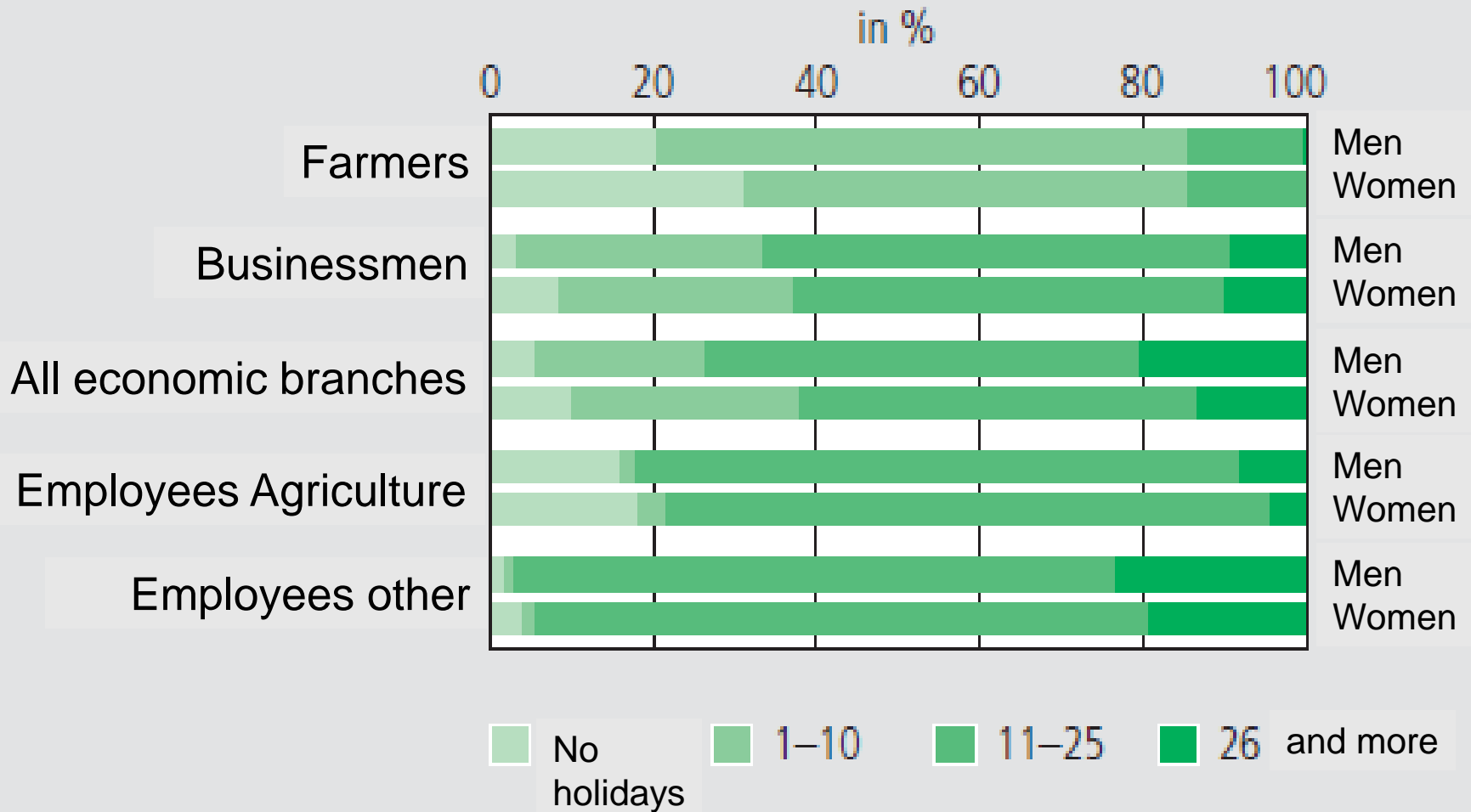
62.4 x 52 = 3245 MPh/year
51.5 x 52 = 2678 MPh/year

Source: SAKE, Swiss Health Survey, FSO / SECO, 2009



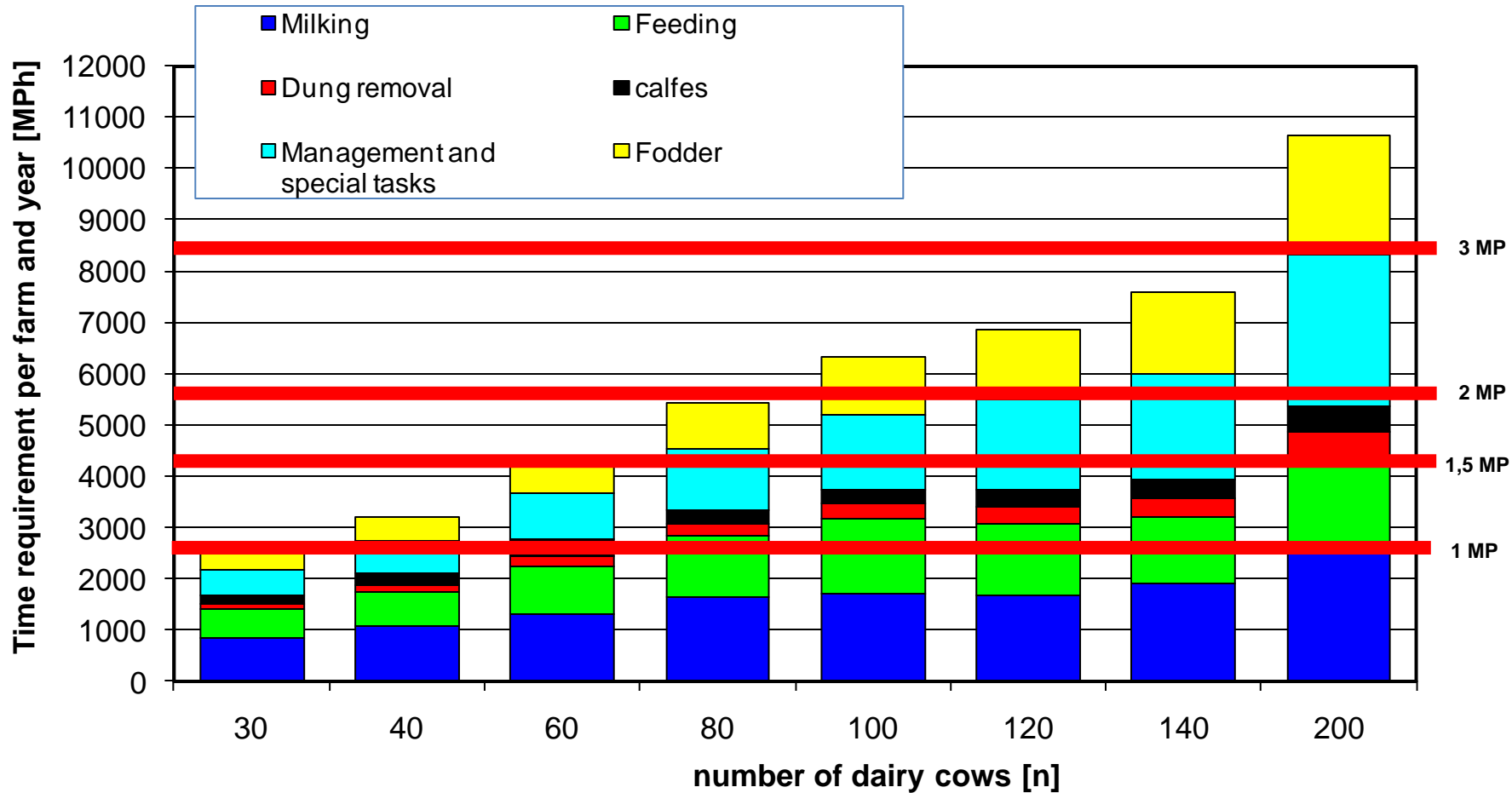
Working in Switzerland III

Number of holidays





Total working-time requirement per Farm and year I „Family workers “

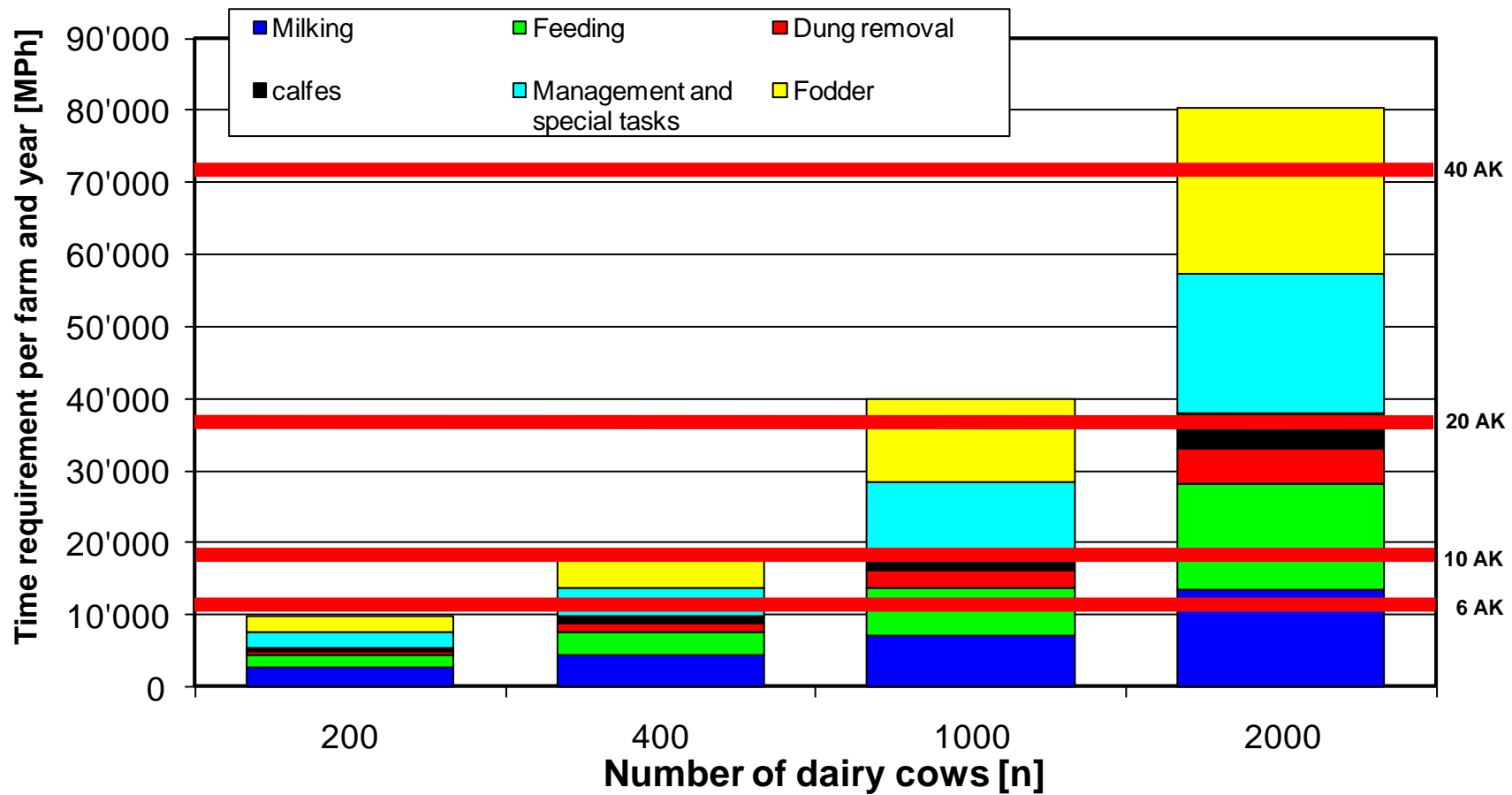


1 MP = 2800 MPH

Source: Schick, 2008

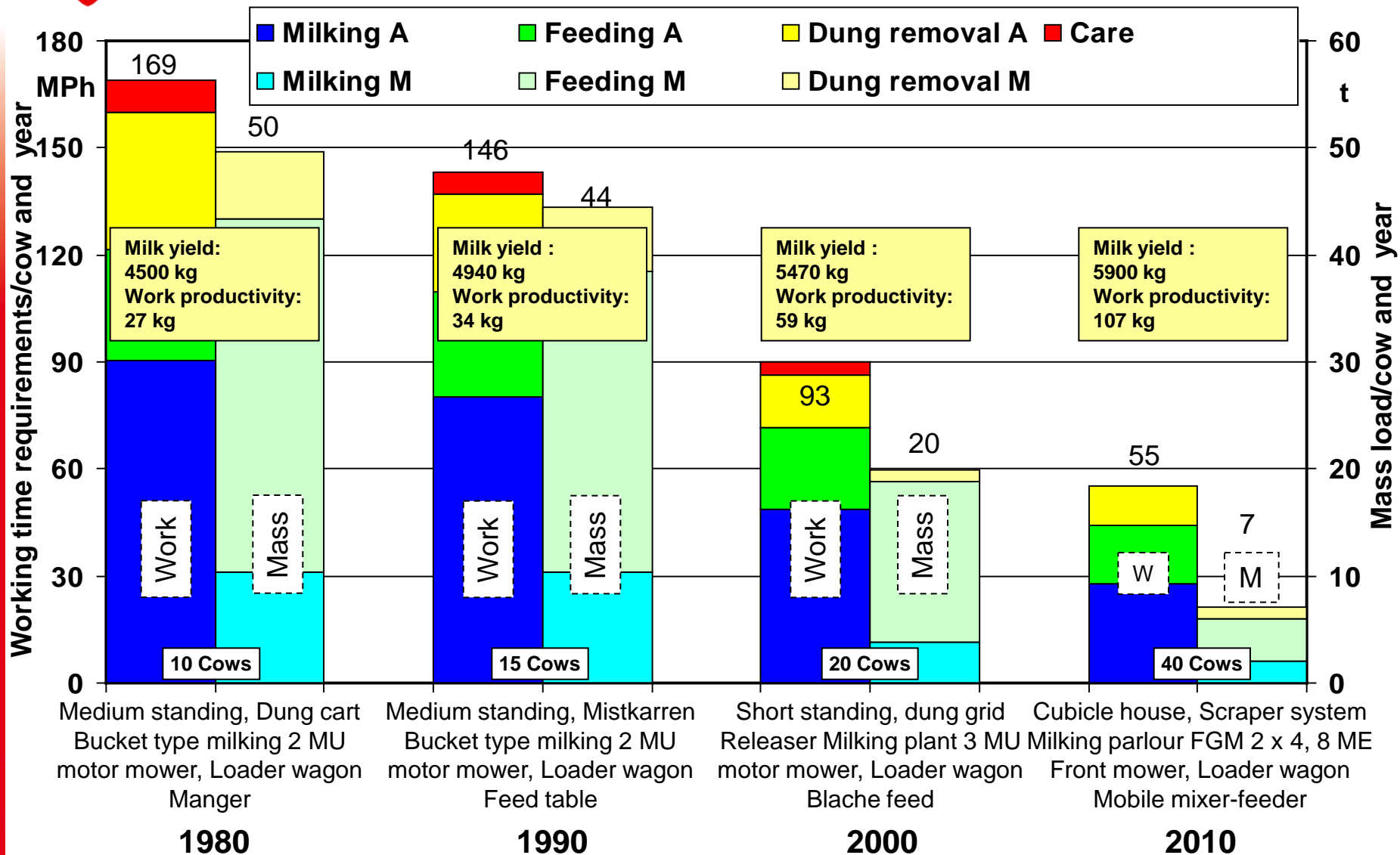


Total working-time requirement per Farm and year II „employed workers “



1 MP = 1800 MPH

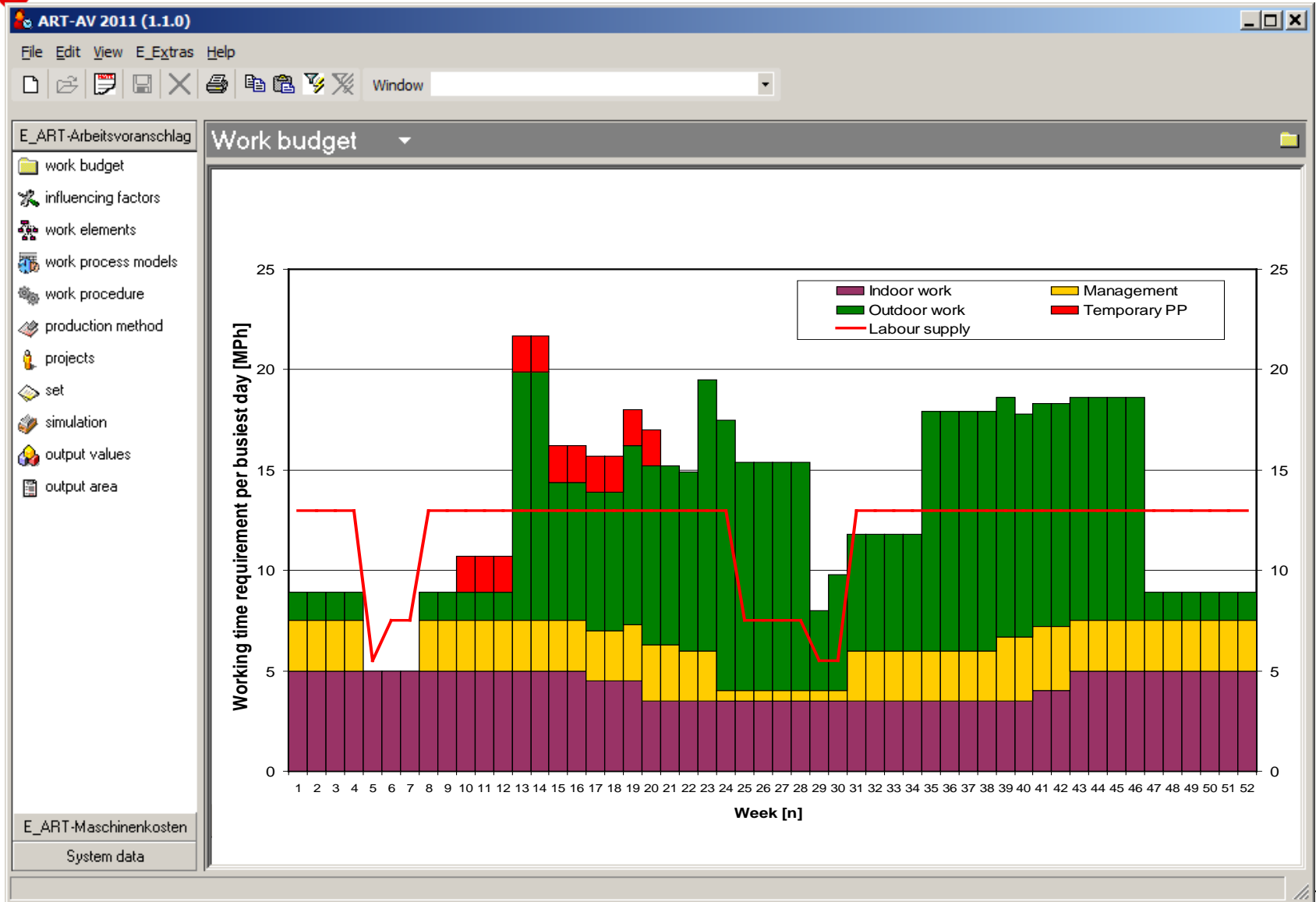
Time requirements of dairy cattle in relation to mechanization



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Human labour: efficiency - effectiveness



Results presentation examples –“Work budget”





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- Time thieves- When we are inefficient at work?

- unclear objectives
- Inadequate priority settings
- technical problems, constructional fail
- bad day planning
- Trying to do too much at once
- postpone, indecision
- Haste and impatience
- Tasks do not lead to an end
- Inability to "no" to say
- Disorder in the workplace
- (pretty trainees)



Catch the thief



Solution of the problem workload

Technology purchase

- New kitchen machine
- Central vacuum cleaning system
- Microwave,
- Steamer

Behavior change

- Discipline
- Catch time thieves
- Setting Goals
- Important things first
- Planning



Optimisation possibilities I

1. Process-engineering optimisation

- Mechanisation of process sequences (Mowing combinations, Feeding, automatic udder-stripping machines, etc.)

- Increased outsourcing of work to third parties (Professional handling of work by specialists [agricultural contractors, machinery rings])



Objective: The professional farmer acts as a specialist in his field



Optimisation possibilities II

2. Organisational optimisation

- **Systematic time planning with clear, measurable objectives**
(Daily/weekly/monthly planning, etc.)

- **Critical points analysis**
(Scrutinise work process
“Where’s the hitch?”)

- **Further education**
(Targeted training every year,
participation in working groups)



Check list for weak-point analysis and improvement of work organisation on the individual farm

Dairy farms	Target	Actual	Comments
Ø daily milk yield/cow milked	> 25		
Ø milk yield/cow over 305 days	> 7500		
Ø milk fat content	Ø 4 (3.8 - 4.2)		
Ø milk protein content	Ø 3.45 (3.2 - 3.6)		
calving interval (days)	< 380		
insemination index	< 1.6		
cows with metabolism problems	< 5 %		
age first parturition (months)	24 - 27		
calf losses	< 5%		
cell counts	< 125,000		
germ counts	< 15,000		
dystocia	< 5 %		
claw problems	< 3 %		
productive life (lactations)	> 4		
percentage of cows in 1st lactation	~ 25 %		



PROOF - forage grass silage

PROOF finish result calculation

PROOF

mechanization level

- low
- medium
- high
- contractor

Actual TARGET

module: forage grass silage

	Modul	numbers of passages	contractor	time consumption			
				Mh/ha	Mch/ha	Mh/ha	Mch/ha
AFNP01: roll	Modul 1	1	<input type="checkbox"/>	0.7	0.4	0.7	0.4
AFNP02: meadow harrow	Modul 2	1	<input type="checkbox"/>	0.5	0.4	0.5	0.4
AFNP03: mineral fertilization	Modul 3	1	<input type="checkbox"/>	1.5	1.2	1.5	1.2
AFNP04: organic fertilization manure	Modul 4	1/4	<input type="checkbox"/>	0.6	0.6	0.6	0.6
AFNP05: organic fertilization slurry	Modul 5	2	<input type="checkbox"/>	2.6	2.5	2.6	2.5
AFNP06: phyto	Modul 6	1/4	<input type="checkbox"/>	0.2	0.1	0.2	0.1
AFNE01: mowing	Modul 7	3	<input checked="" type="checkbox"/>	1.9	1.5	0.5	0.0
AFNE02: rotary rakes	Modul 8	6	<input type="checkbox"/>	2.5	1.9	2.5	1.9
AFNE03: rotary swadows	Modul 9	3	<input type="checkbox"/>	1.2	1.0	1.2	1.0
AFNE04: harvesting loading wagons	Modul 10	0	<input type="checkbox"/>	3.4	3.1	0.0	0.0
AFNE05: store	Modul 11	0	<input type="checkbox"/>	0.0	0.0	0.0	0.0
AFNE06: forage harvester	Modul 12	3	<input checked="" type="checkbox"/>	0.0	0.0	1.5	0.0
AFNE07: store silo I	Modul 13	3	<input type="checkbox"/>	1.5	1.2	1.5	1.2
AFNE11: store silo II	Modul 14	0	<input type="checkbox"/>	0.0	0.0	0.0	0.0
AFNE08: harvesting bales	Modul 15	0	<input type="checkbox"/>	0.0	0.0	0.0	0.0
AFNE09: wrapping bales	Modul 16	0	<input type="checkbox"/>	0.0	0.0	0.0	0.0
AFNE10: store bales	Modul 17	0	<input type="checkbox"/>	0.0	0.0	0.0	0.0
	Modul 18		<input checked="" type="checkbox"/>				
total:				16.6	13.9	13.3	9.2
total per cut				5.6	4.6	4.4	3.1



Definition of terms II

Manage

Manage =
To lead people in such a way that goals
can be achieved by well-planned, organised
and monitored achievement.

Source: Hub, 1982



Time is limited - Quality of Life

A year is 8760 Hours

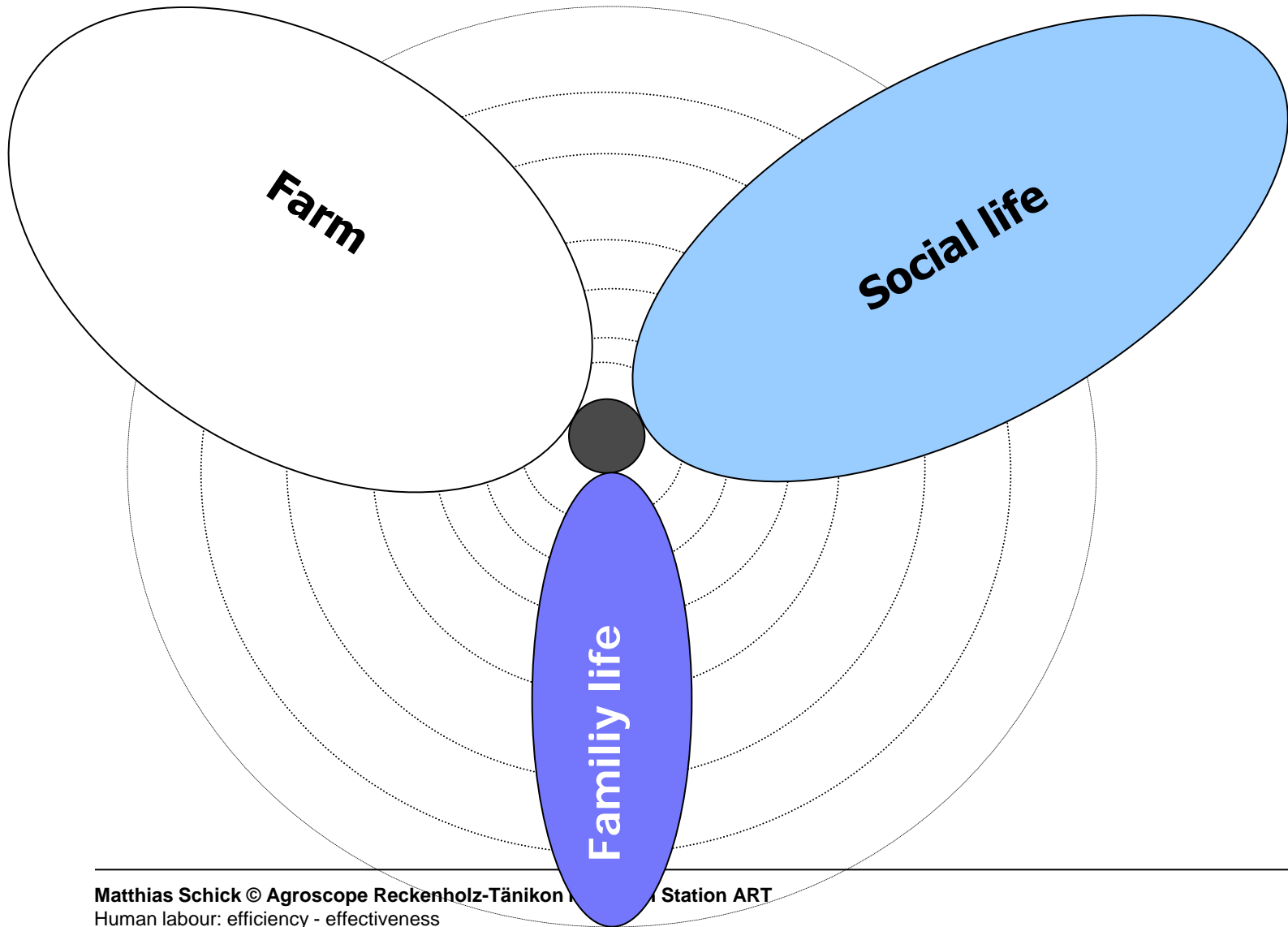
Of this we sleep
(8 hours per day) 2920 Hours

We remain 5840 Hours

... and now?

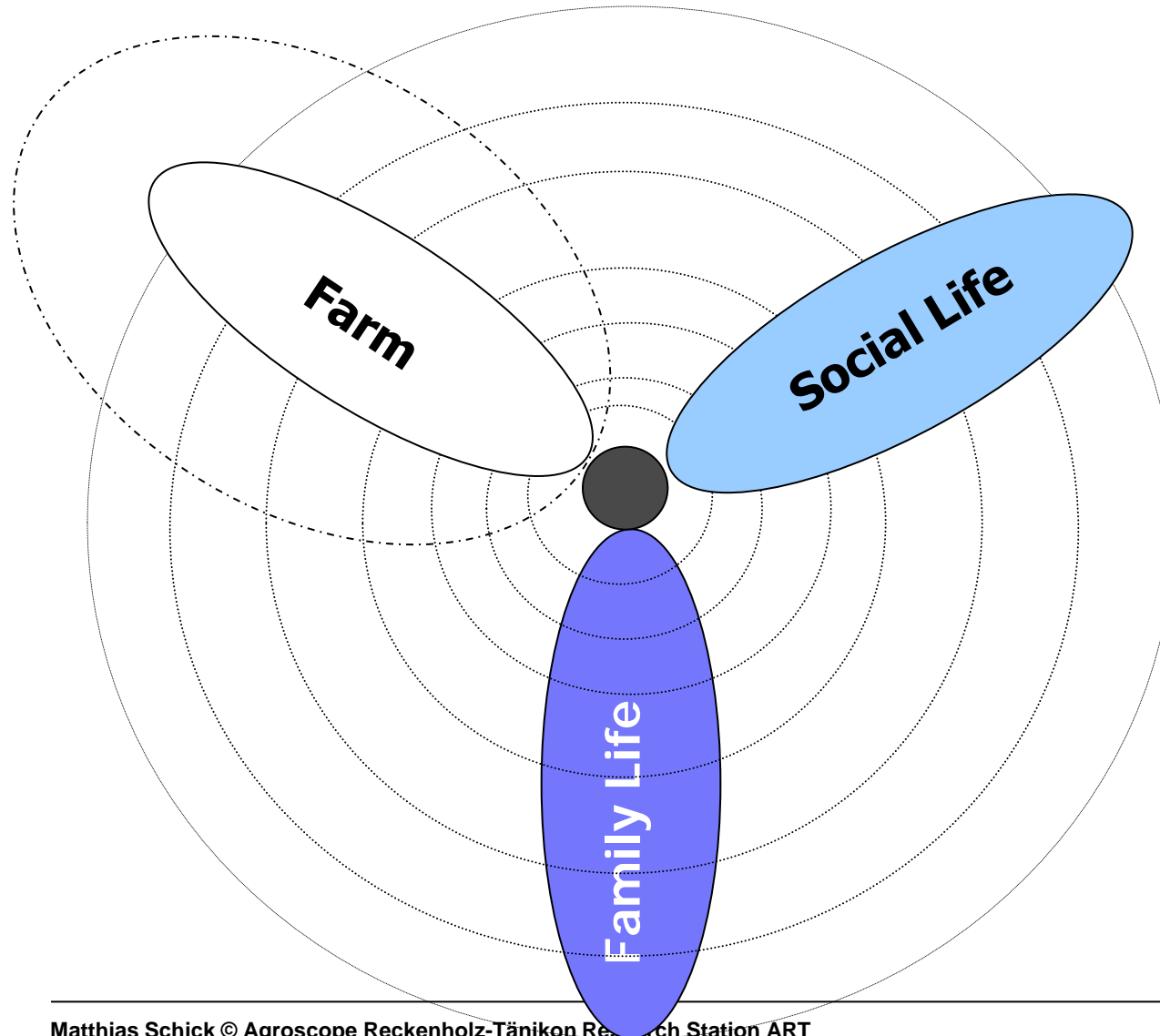


Life (and time) in balance! (?)





Life (and time) in balance!





Conclusions I

**Time planning is the main basis for the healthy
interaction between
work,
family
and social environment**



Conclusions II

- ✓ **Good work organization requires
Consistent time planning**
- ✓ **Weak points analysis means
identify problems**
- ✓ **Labour Organization + problem identification**
 - = 1. Problem solving**
 - = 2. Increasing motivation**
 - = 3. Job satisfaction**
 - = 4. Increasing efficiency**



Catch the thief
Haltet den Dieb
Au voleur
Stop ladro
Stop varas
Διακοπή κλέφτης
Houd de dief
Stop zloděj