



Schils

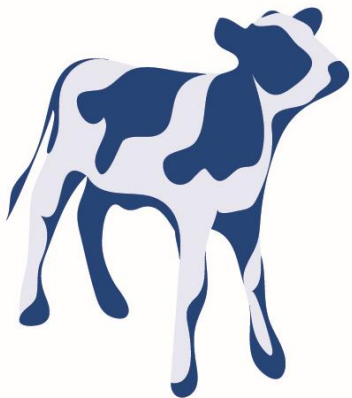
- 1) Calf Rearing: development and feeding**
- 2) The 1 KG Growth Program**

2019

Questions



1. How much can a calf grow in the first 10-12 Weeks? (what is our goal?)
2. How much kg Calf Milk Replacer do we have to give? When (begin-middel-end)?
(Feeding schedule 30-40-50-60-70 kg CMR, or ad lib?)
3. How much solid feed can a calf eat at week 3, 5 and 7 per day.
4. What is the optimal concentration of CMR and water in milk?



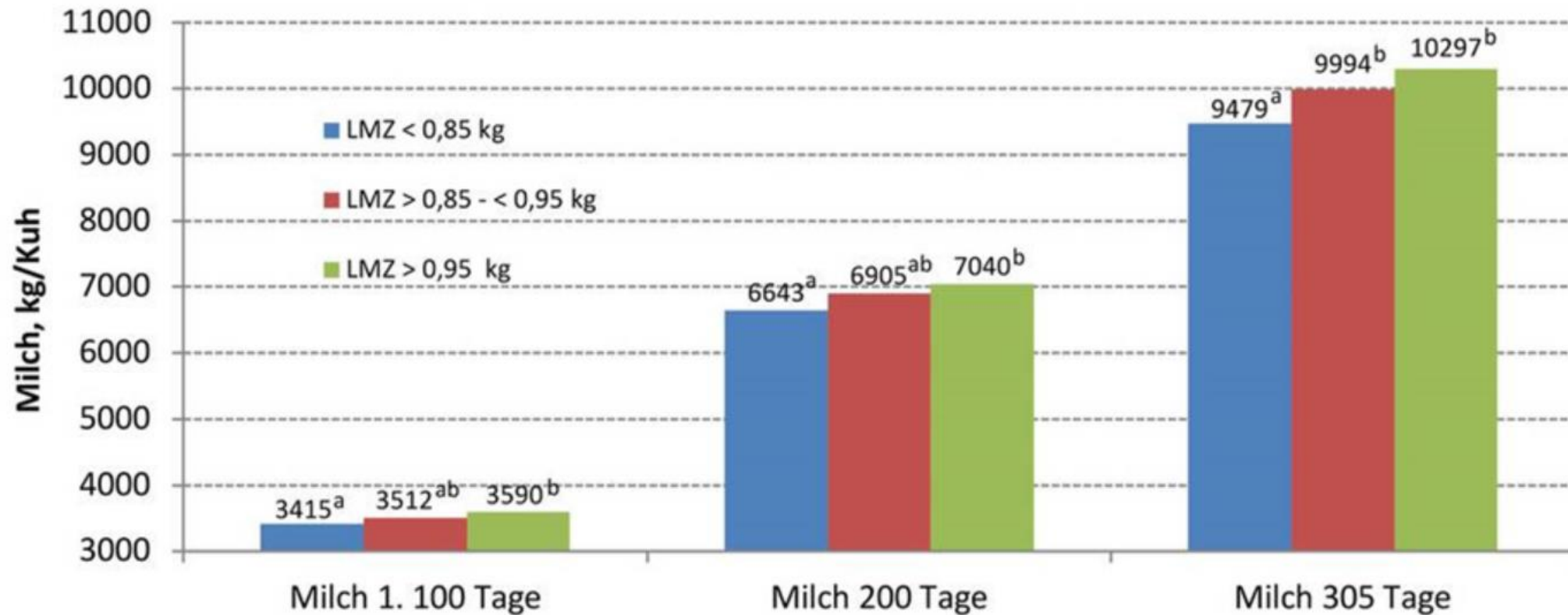
Extra growth of young calves is positive correlated with future milk production in 1. and 2. Lactation:



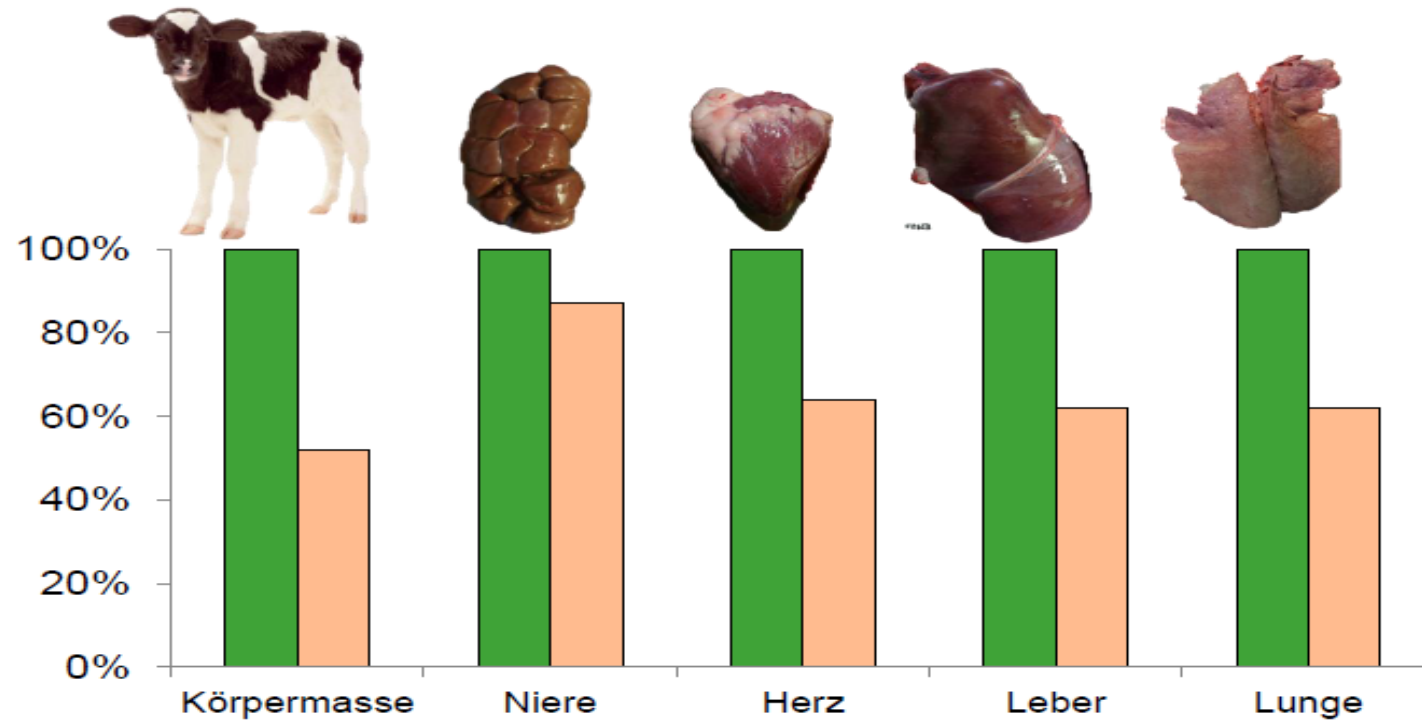
Authors	year	Diff. Milk kg
Foldager and Krohn	1994	1.402
Foldager et al.	1997	518
Bar-Peled et al.	1997	453
Ballard et al.	2005	700
Rincker et al.	2006	499
Moallem et al.	2006	1.134
Drackley et al.	2007	835



Young calves: Influence ADG on milk production in first lactation



Organ growth



Wachstumsminderung bei verminderten Zunahmen:

Kälber bis 50. Lebenstag

- intensiv
- restriktiv

(nach Fiebig et. al 1985)



**Trial: CMR with 45% SMP and no SMP
Normal (35kg) vs intensive (50kg) feeding schedule**

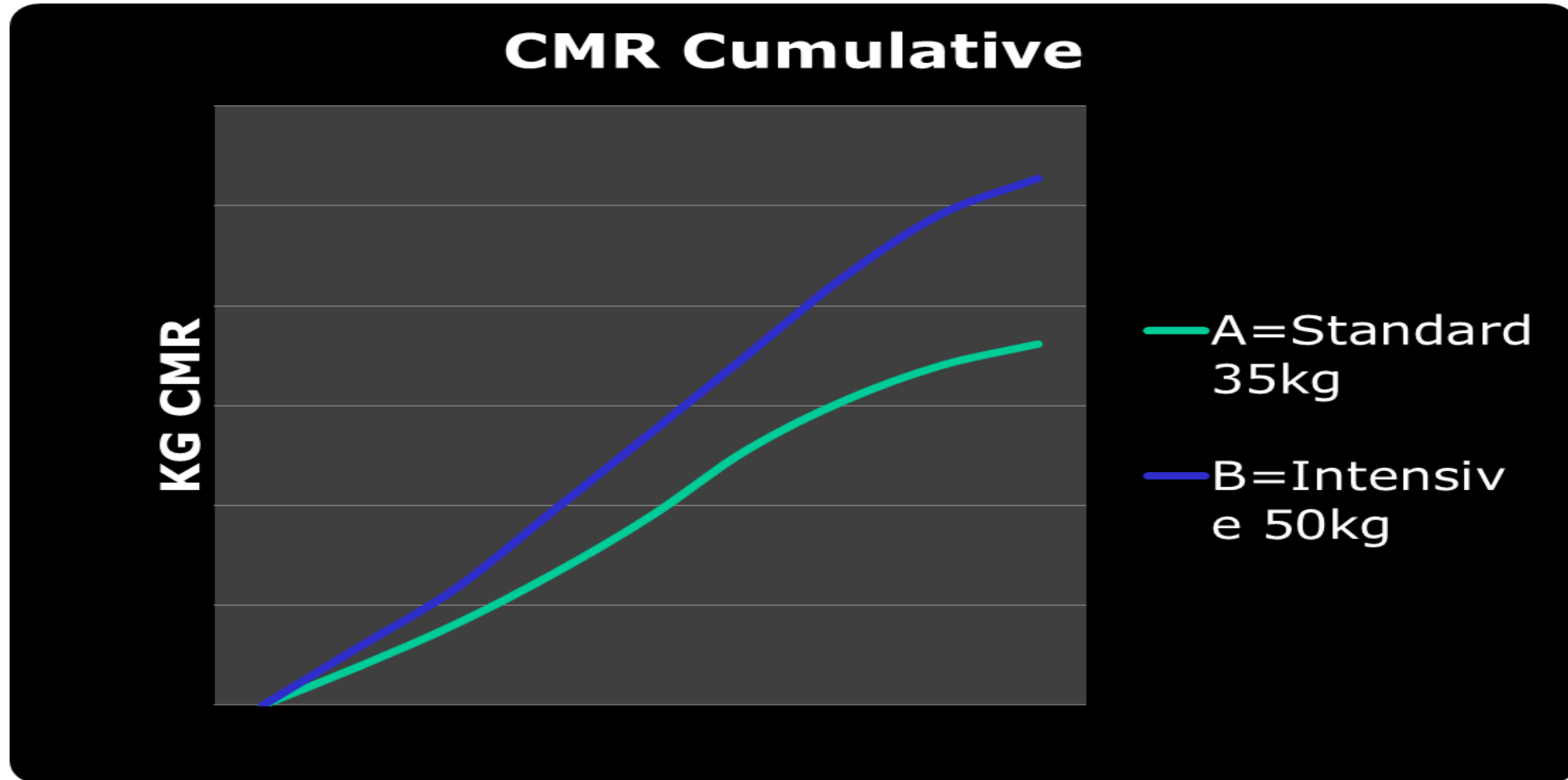
Effects on growth and solid feed intake

Feeding schedule in liters CMR/day: 140 g/L CMR



WK	Group 1 35 kg CMR	Group 2+3 50 kg CMR
1	4	6
2	4,5	6
3	5	7
4	5,5	7,5
5	6	8
6	5	8
7	4	6
8	2	4
9	0	0
10	0	0

CMR intake cumulative



Live weight in kg



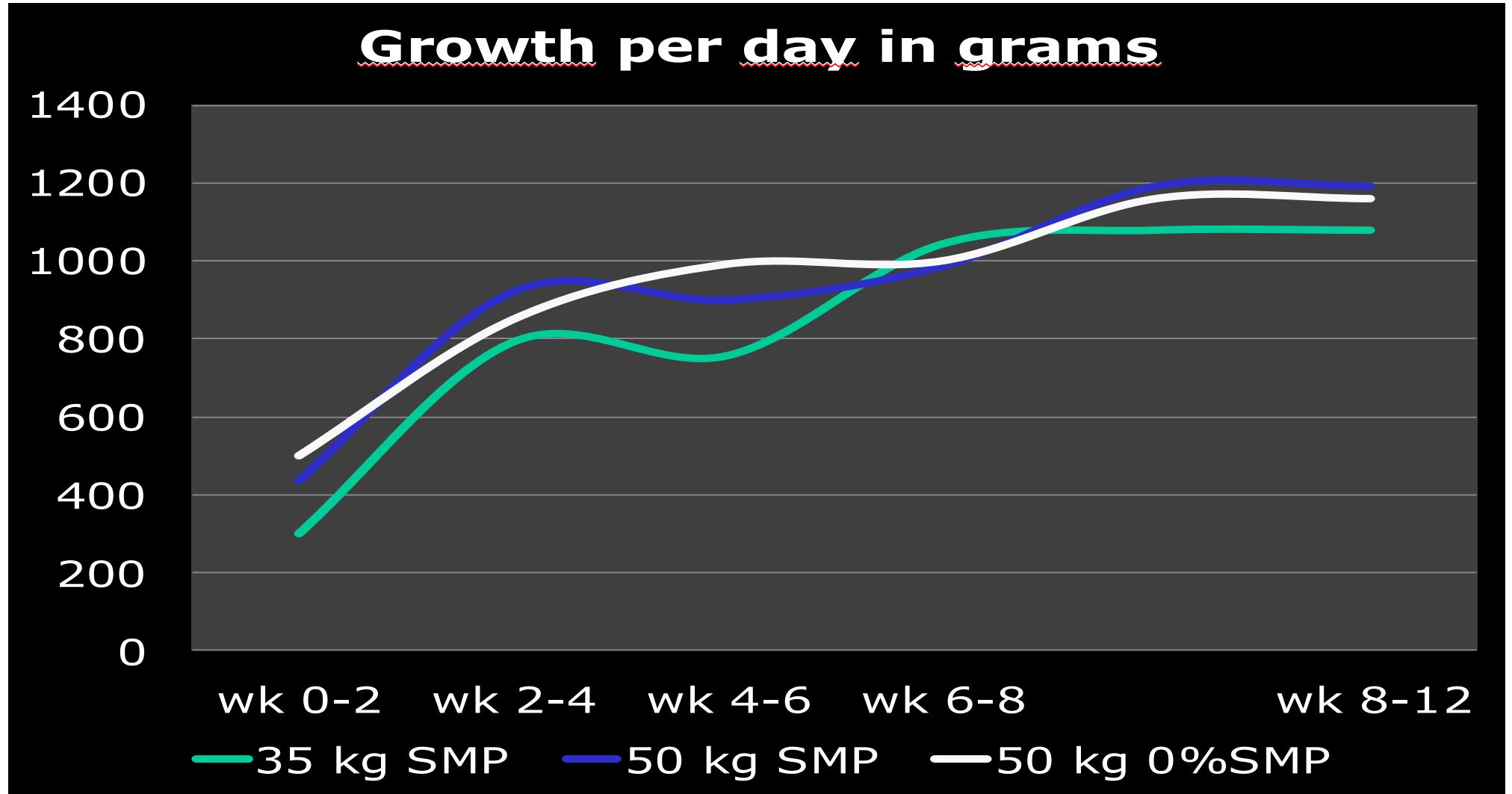
WK	Group 1 35 kg CMR	Group 2 50 kg CMR	Group 3 50 kg (0%)
0	52.4	52.4	52.5
2	56.6	58.5	59.5
4	67.7	71.4	71.4
6	78.3	84.0	85.3
8	92.9	97.8	99.3
12	123.1	131.2	131.8
n=	36	35	36

Growth in grams/day per period



WK	Group 1 35kg CMR	Group 2 50kg CMR	Group 3 50kg (0%) CMR
0-2	300	436	500
2-4	792	921	850
4-6	757	900	992
6-8	1043	986	1000
8-12	1079	1192	1160
n=	36	35	36
0-8 wks	723	873	900
0-12 wks	839	938	946

Growth day/grams



Remarks

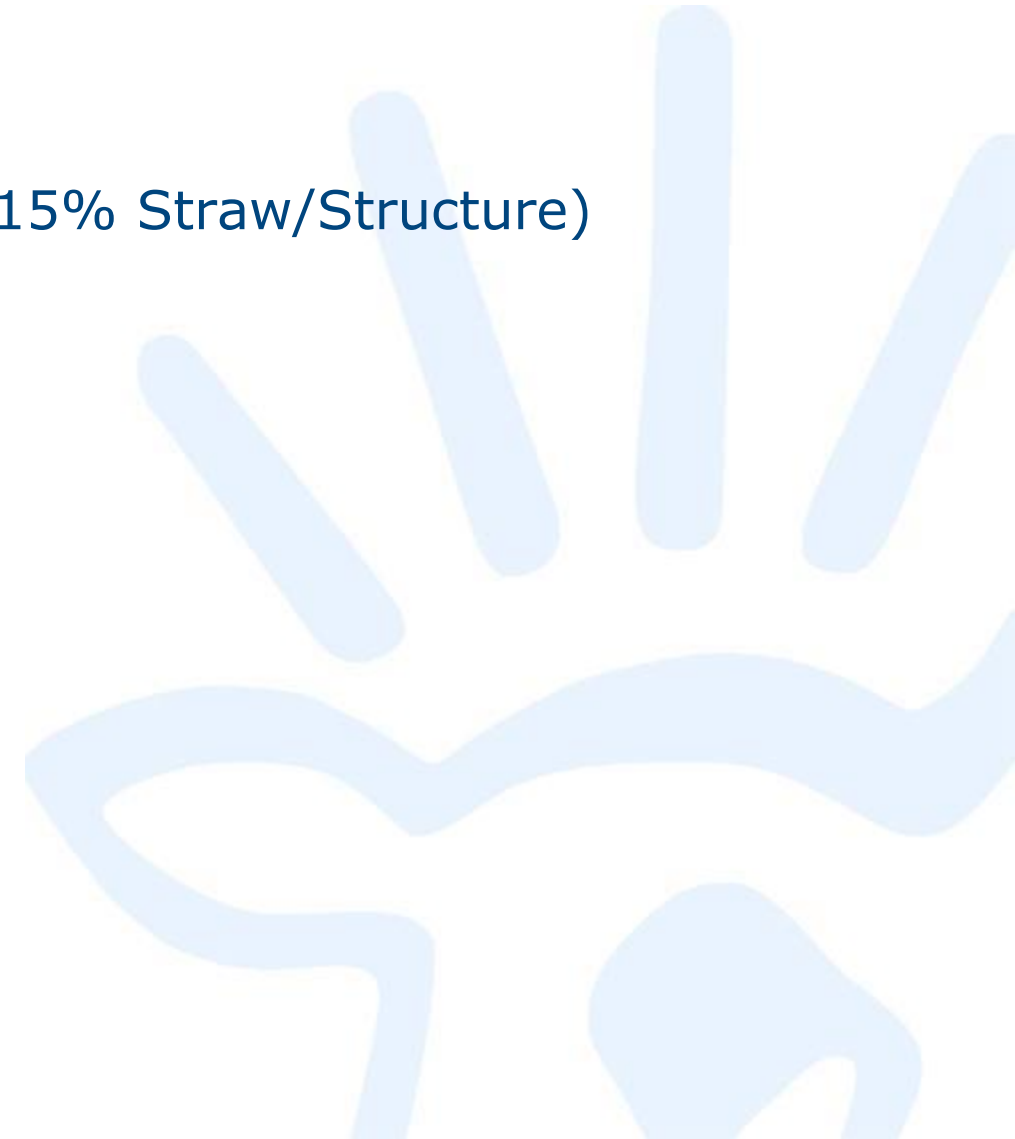


- Best Bodyweight at 8 and 12 weeks with 50 kg CMR's
- More intensive feeding schedule resulted in better growth in all periods
- 15kg more CMR results in 8 kg more bodyweight
- No compensatory growth after weaning
- "Good" CMR without SMP gives similar results as CMR with 45% SMP
- Growth-curve depression at 4-6wks for the group 35kg CMR

Calves from 1-10 Weeks



- Feed conversion from CMR?
- Feed conversion from solid feed
- How much solid feed intake (including 10-15% Straw/Structure)

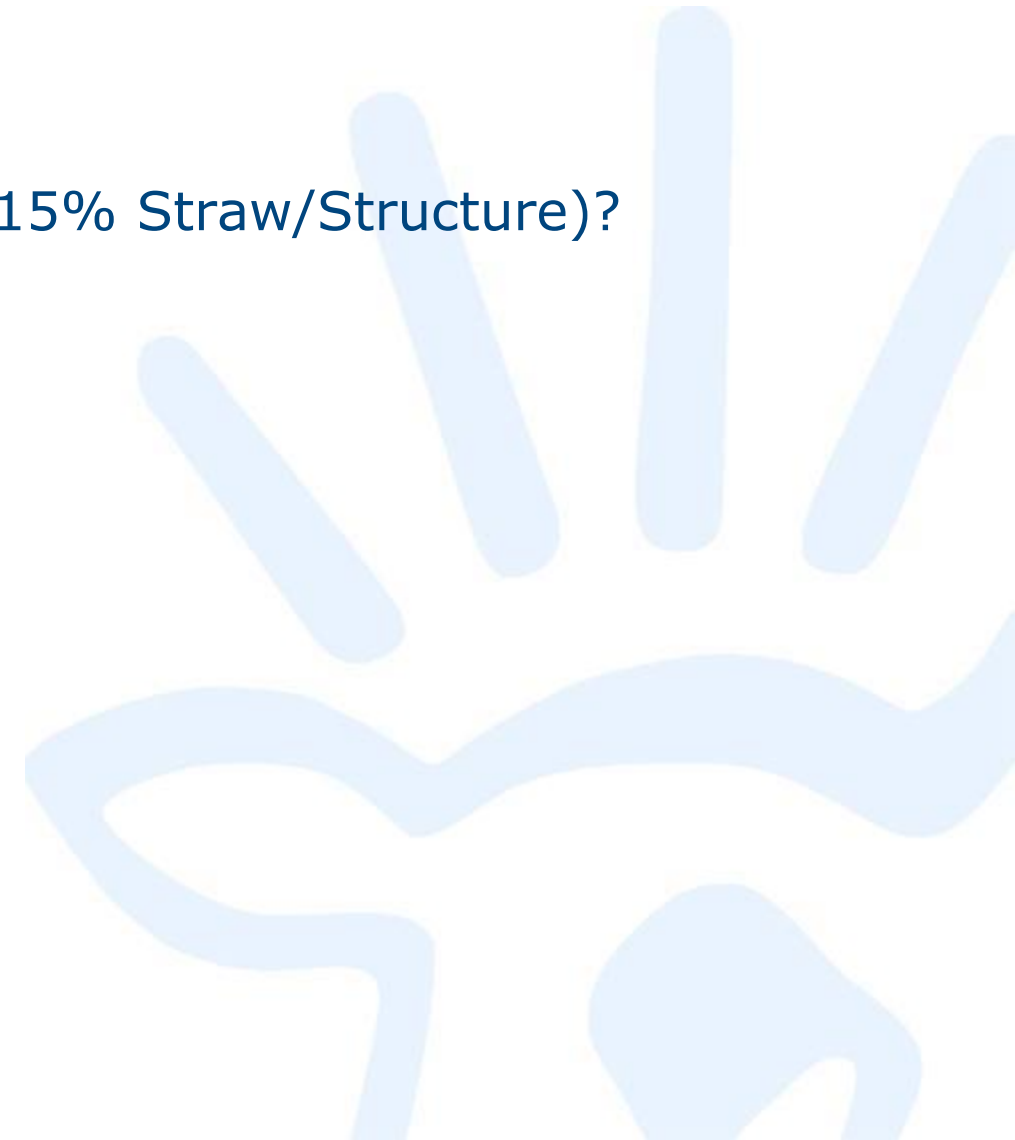


Calves from 1-10 Weeks

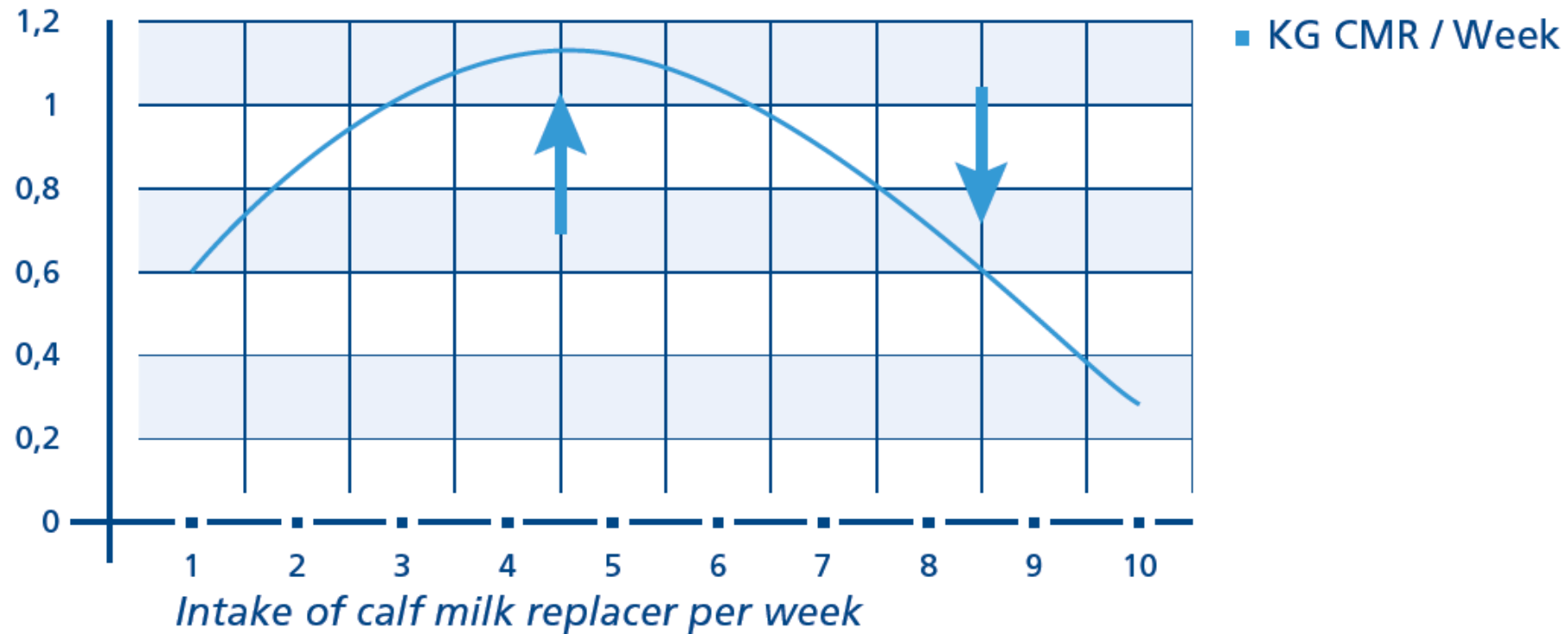


- Feed conversion from CMR?
- Feed conversion from solid feed?
- How much solid feed intake (including 10-15% Straw/Structure)?

- 1,7 kg CMR for 1 kg growth
- 4,5 kg Solid Feed for 1 kg growth
- Limited solid feed intake:
 - Week 5 500gr/day
 - Week 7 1000gr/day
 - Week 11



CMR Feeding schedule: 55 kg



- Intensive Start: first 5 Weeks
- Reducing CMR: from 6 Weeks stimulates solid feed intake

Solid feed intake is limited! (Big variation)



Solide feed intake

	<u>per Day</u> (kg)	<u>Cumulative</u> (kg)
W1		
W2		
W3		
W4		
W5		
W6		
W7		
W8		
W9		
W10		
W11		



Solid feed intake is limited! (Big variation)

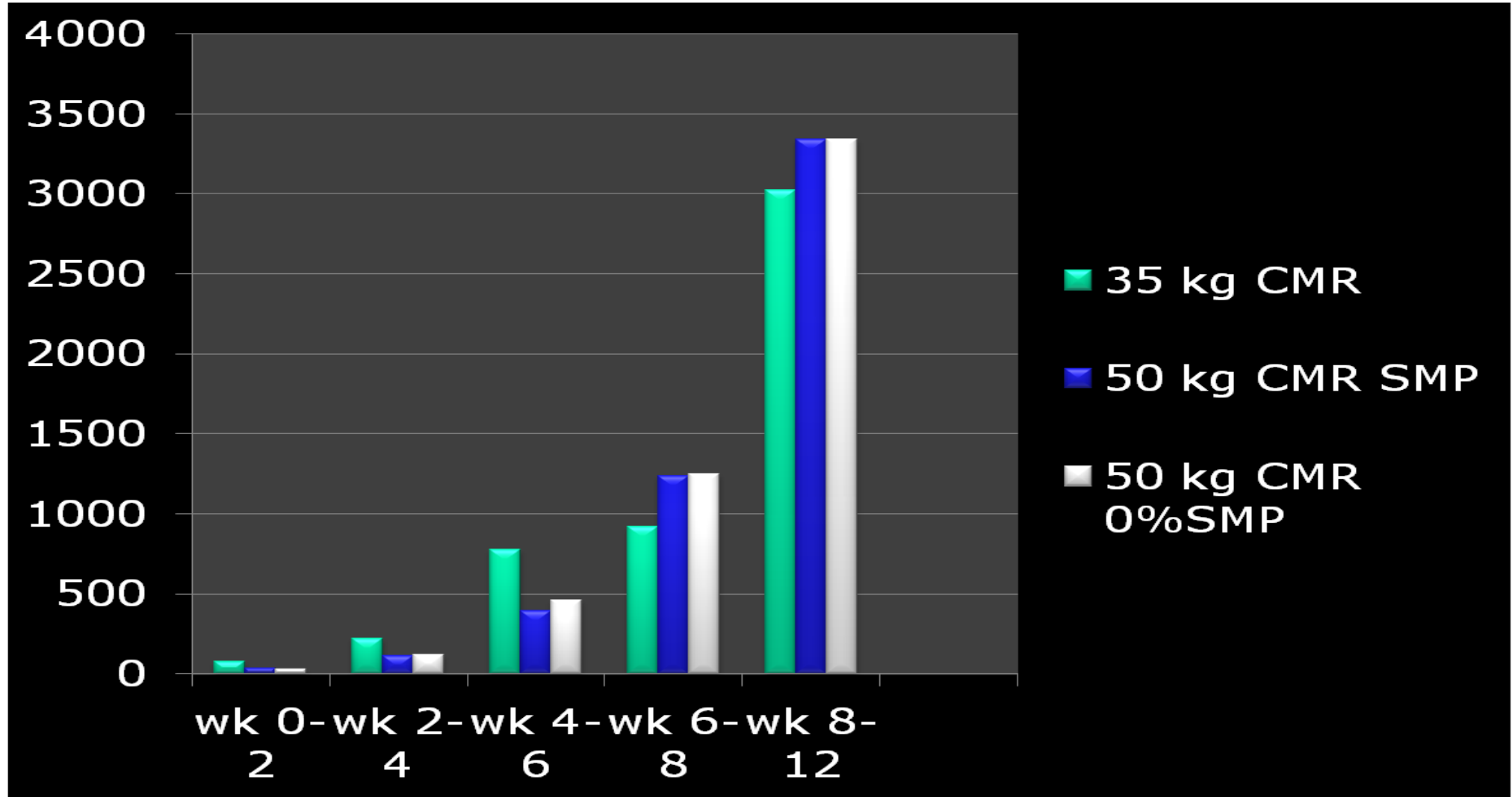


Solide feed intake

	<u>per Day</u> (kg)	<u>Cumulative</u> (kg)
W1	0,03	0,2
W2	0,215	1,7
W3	0,30	3,7
W4	0,425	6,7
W5	0,570	11
W6	0,700	17
W7	1,0	25
W8	1,7	37,5
W9	2,5	57,5
W10	3,5	85
W11	4	115



Solid feed intake day/grams



Solid feed intake kg/period

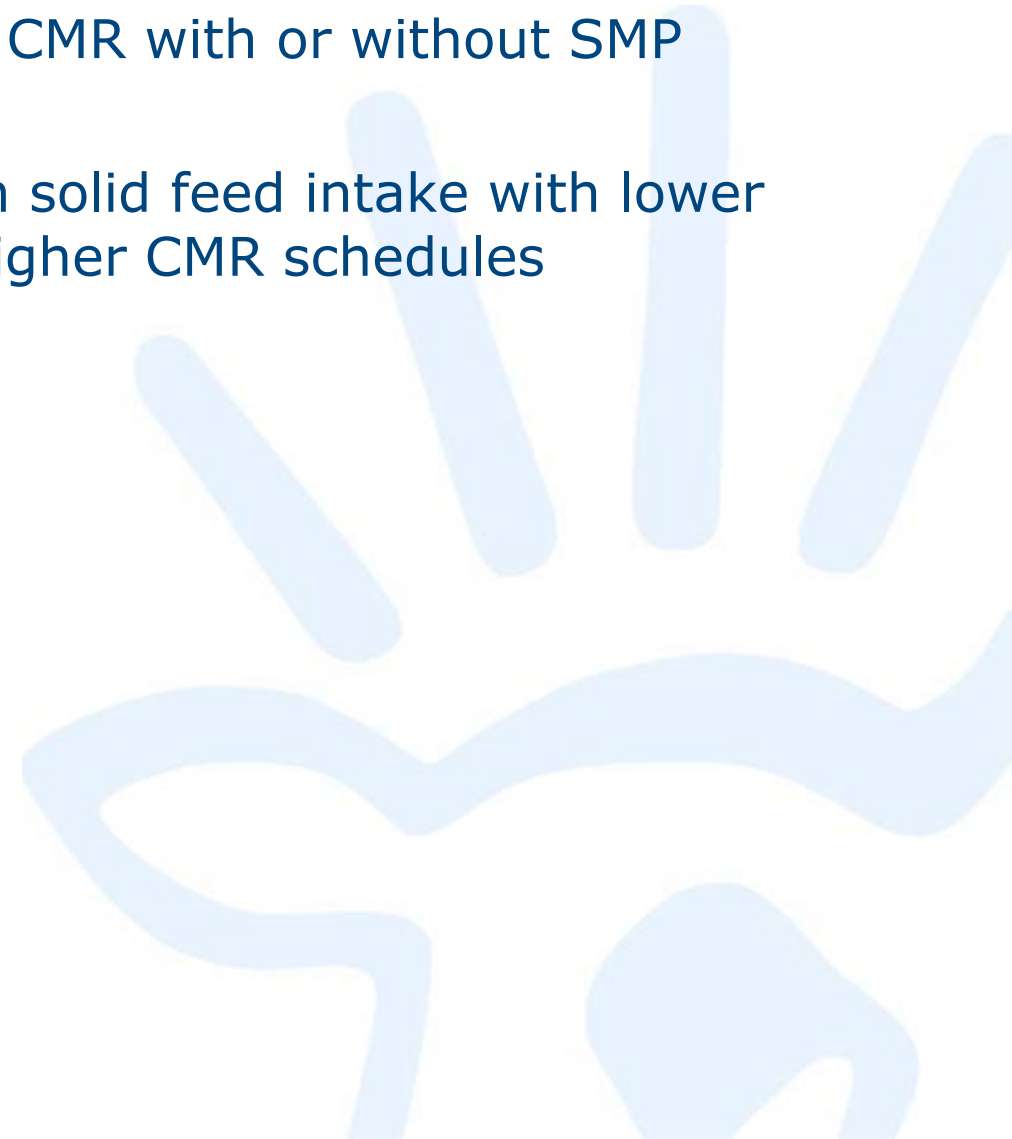


WK	Group 1 35 kg SMP	Group 2 50 kg SMP	Group 3 50 kg 0% SMP
0-2	1,1	0,5	0,4
2-4	3,1	1,6	1,7
4-6	10,9	5,5	6,4
6-8	12,9	17,3	17,5
8-12	84,6	93,5	93,5
n=	36	35	36
0-8 wks	28	26	24,9
0-12 wks	112,6	118,4	119,5

Remarks



- No difference in solid-feed intake between CMR with or without SMP
- From week 6 onwards no positive effect on solid feed intake with lower CMR gift. Even more solid feed intake at higher CMR schedules
- Higher growers eat more solid feed!



Feeding schedules



- Effect on growth and solid feed intake
- More growth first 10 weeks gives more milk in 1st. and 2nd lactation
→ investment will be payed back!!
- Higher concentration up to 140-150 g/Liter Milk
(is 150CMR+850 Water. 150g CMR + 1L Water is 130g/Liter Milk)
- Better growth before weaning gives better growth after weaning too
- More CMR = healthier calves at week 4. → less Lung problems, less Antibiotics!
- Better growth first 4-5 weeks stimulates solid feed intake after weaning
- Reducing feeding schedule after week 5 stimulates solid feed intake.
No ad lib CMR after 6 weeks of age.
- Weaning before week 8 is not good. Calves are not fysiological ready to live without CMR,
too much stress during after weaning. → growth dip.

Trial: Solid Feed intake in gram/day



Week	A=Standard 125g/L	B=Intensive Start	C=140g/L
0-2	150	92	157
2-4	342	300	364
4-6	842	1135	920
6-8	2435	2628	2520
8-11	3176	3290	3319

- Solid Feed intake in first 4 weeks not above 400 g/day → ? g/growth
- Intensive feeding in first 5 weeks results in higher growth and and beter solid feed intake



Schils



Trial:
Comparison of feeding schedules, intensive start and differences in concentration

Different feeding schedules



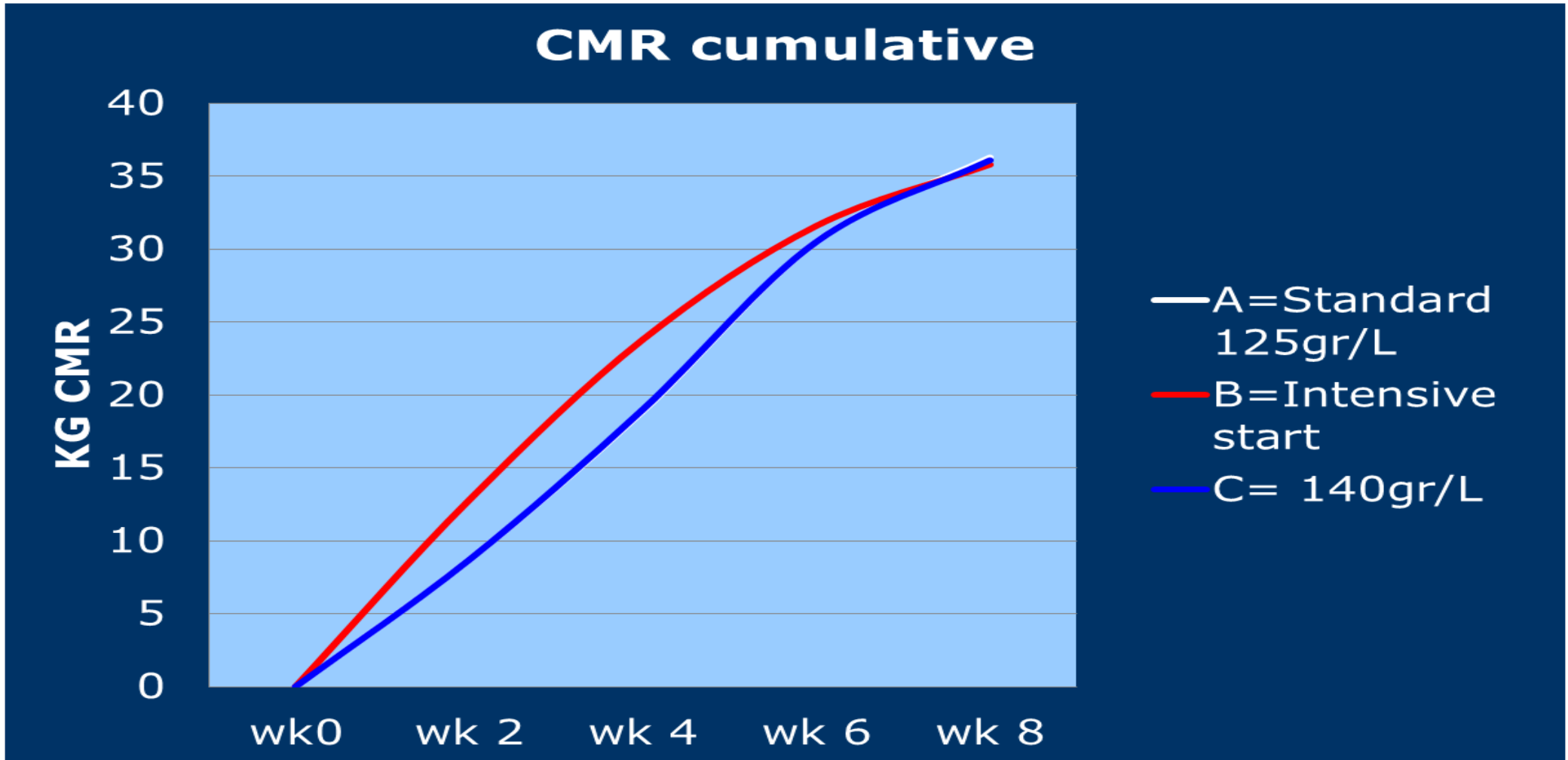
- A: **Standard Schils** = 140g+1000g water = *125 gram CMR/1000gram milk*
- B: **Intensive start/Kunz-Plan** = Start 160g+1000g and more liters, afterwards 120g +1000g and less liters
- C: Like **A however 160g+1000g** water = *140g CMR/1000g milk*

Feeding schedule per group

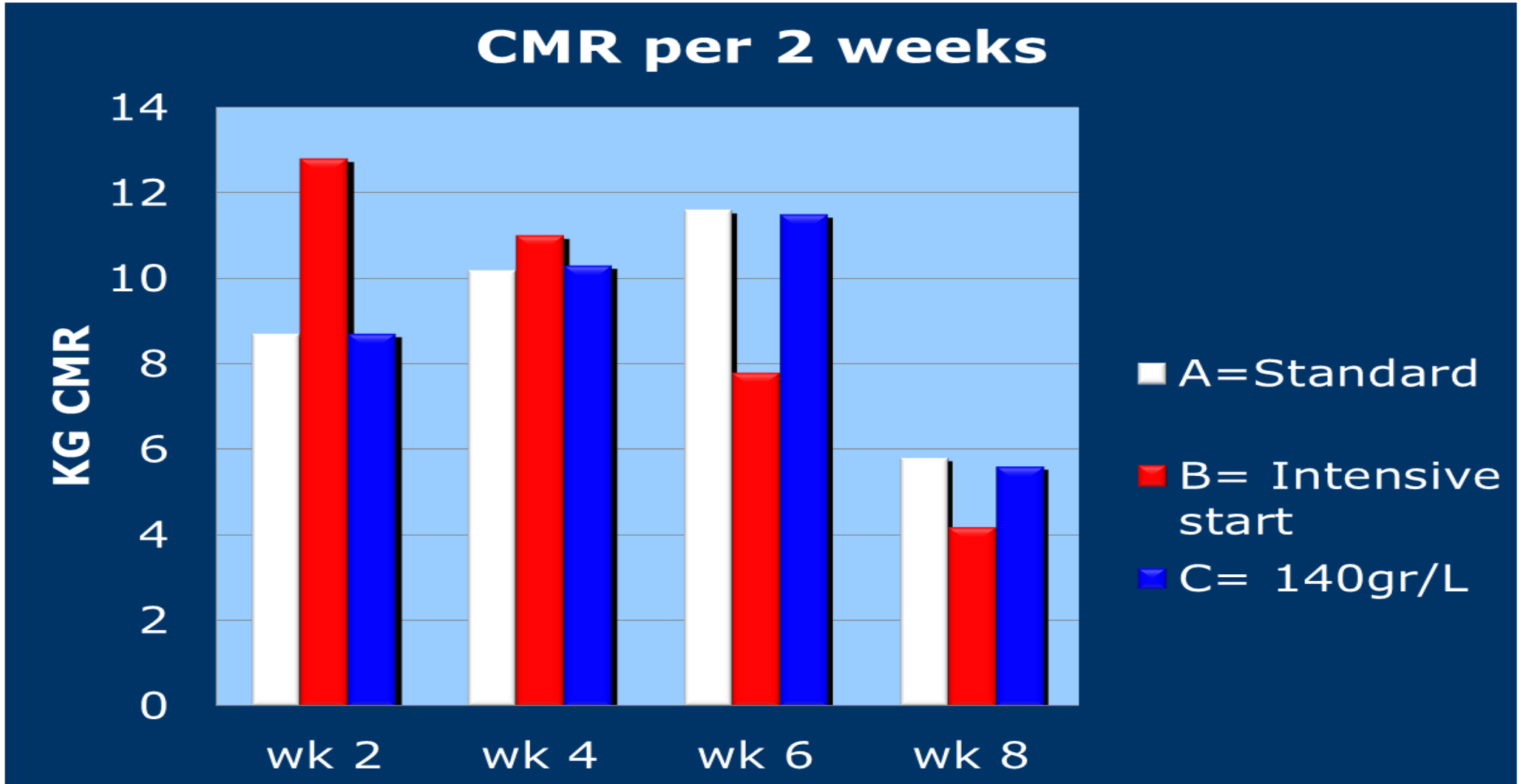


Day	A			B			C		
	Conc g+1L	Liter water	Kg CMR	Conc g+1L	Liter water	Kg CMR	Conc g+1L	Liter water	Kg CMR
1-5	140	4	3	160	5-6	5	160	3,5	3
6-25	140	4-6	17	160	6	22	160	3,5-5,4	17
26-35	140	6	25	120	6-4	29	160	5,4-5,2	25
36-56	140	6-2	37	120	4-2	37	160	5,2-1,8	37

Intake milk replacer



CMR intake per 2 weeks



Trial conditions



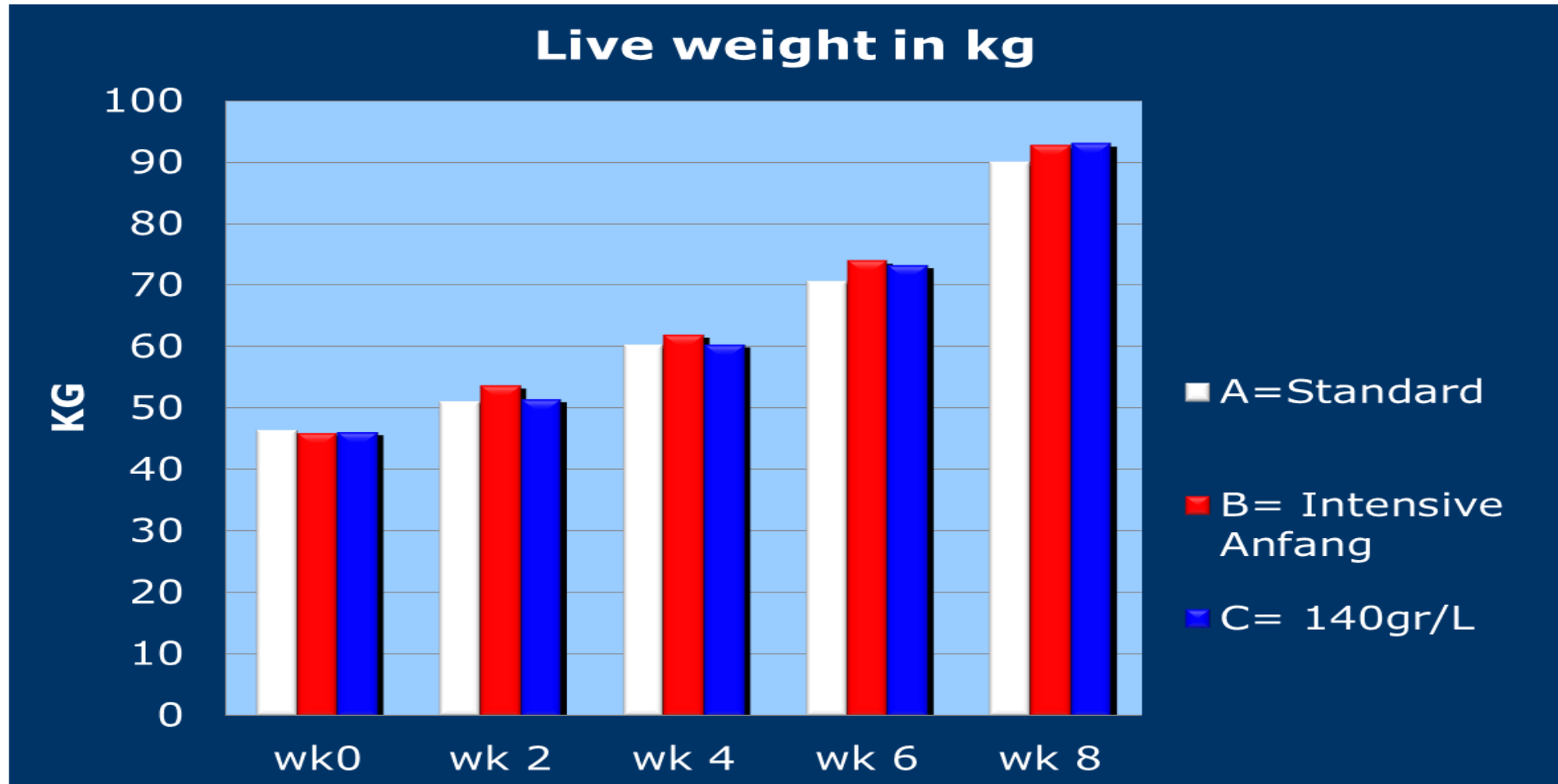
- One CMR in different feeding schedules. All with 37kg CMR.
- Calf Milk Eurolac SMP25
- Ad Libitum intake solid feed (concentrated feed + straw)
- 40 calves per group (2*20 calves), ca. 46 kg

Live weight (kg)



WK	A=Standard 125g/L milk	B=Intensive start	C=140g/L
0	46,5	46,1	46,2
2	51,3	53,8	51,6
4	60,4	62,1	60,5
6	70,8	74,1	73,4
8	90,1	92,9	93,2
11	110,8	114,5	113,7

Weight calves (kg)



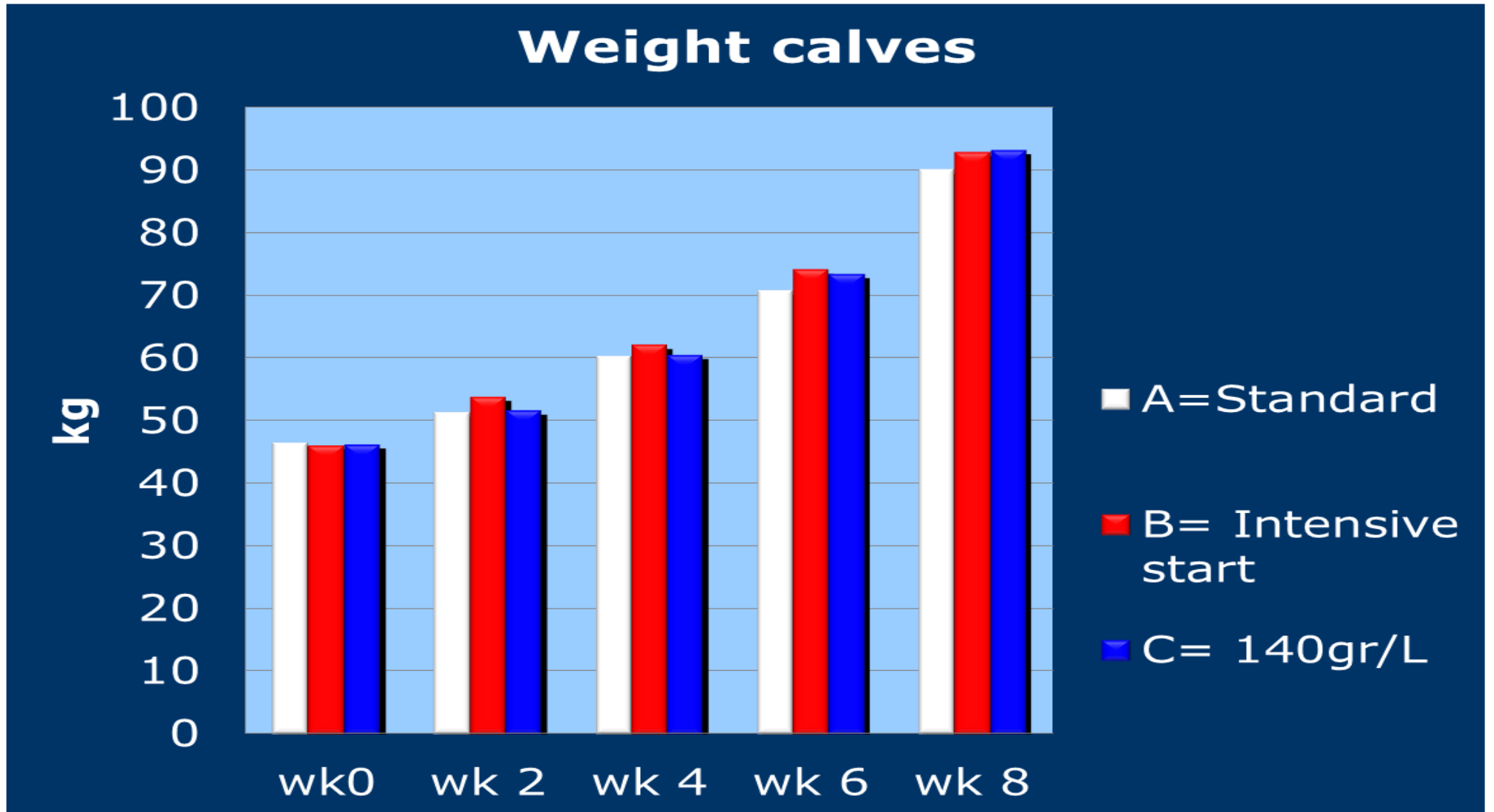
Increase gram/day



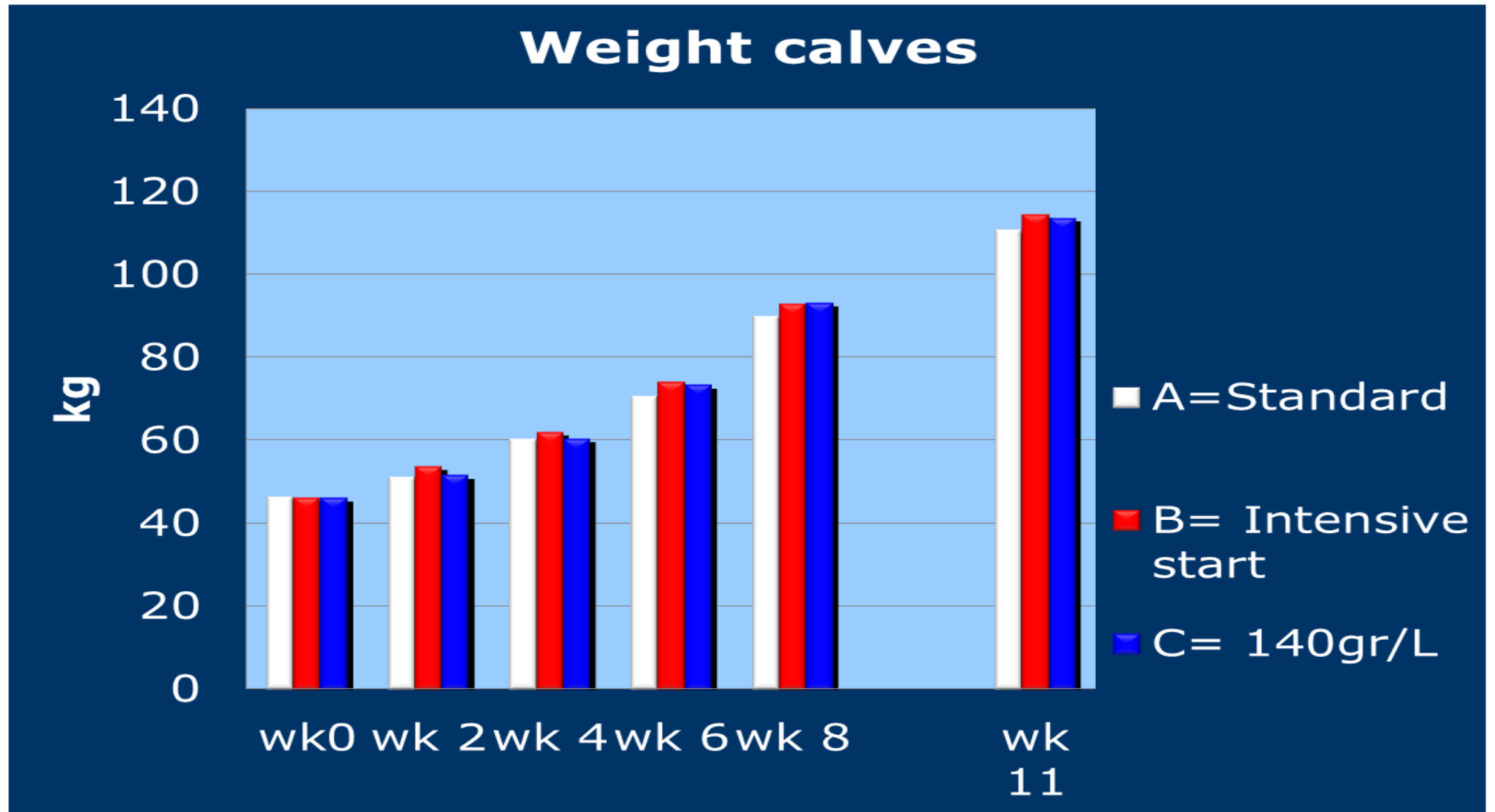
WK	A=Standard 125g/L milk	B=Intensive start	C=140g/L milk
0			
2	320	513	360
4	700	638	685
6	693	800	860
8	1287	1253	1320
11	1150	1200	1139

- Group B larger increase first 4 weeks
- Group B and C larger increase 4-8 weeks

Weight calves (kg)



Weight calves (kg)



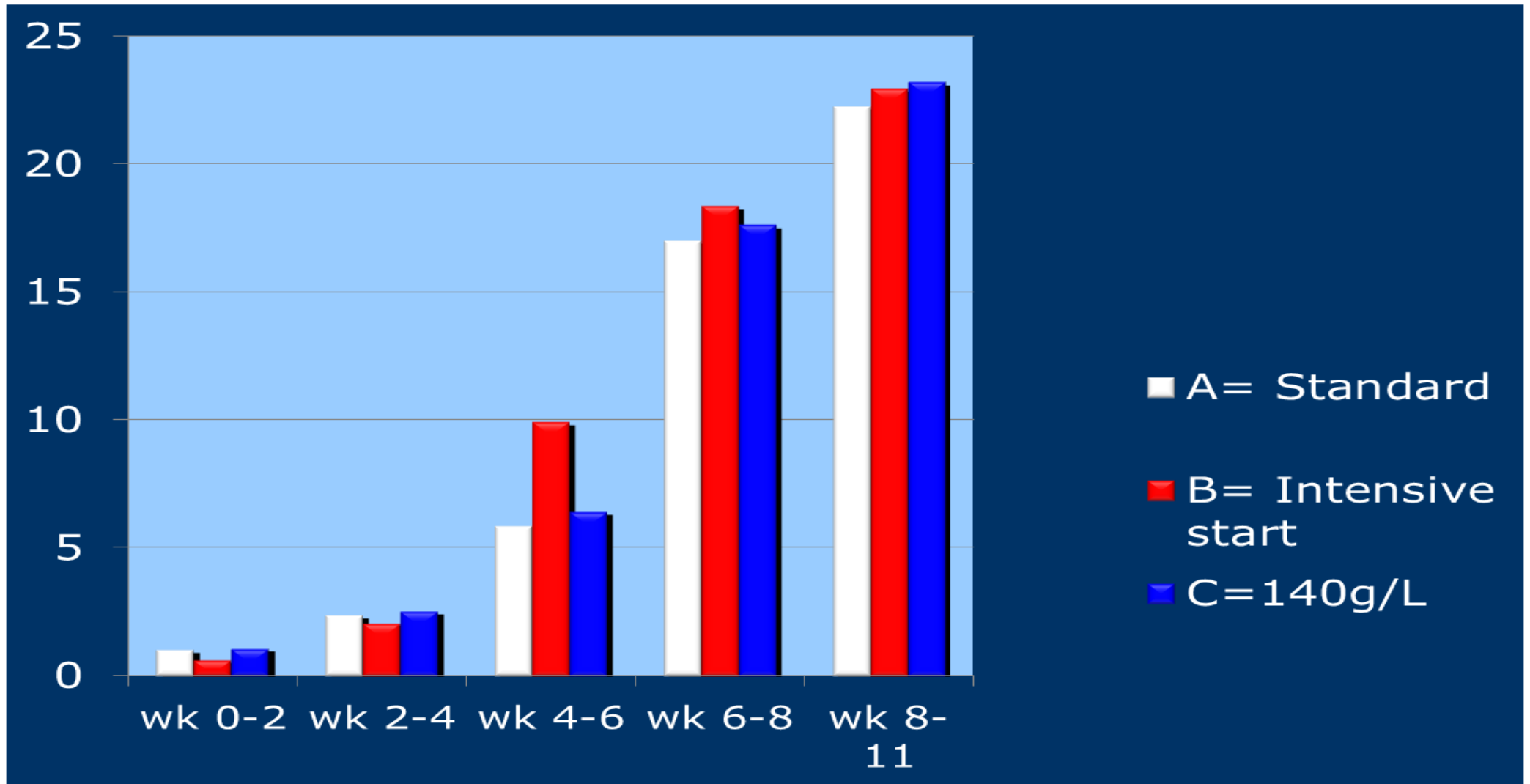
Veterinary treatments (%)



	A=Standard 125g/L milk	B=Intensive start	C=140g/L milk
Intestines	0%	9%	6%
Lungs	53%	35%	44%
Other	6%	0%	6%

- Group B and C more faeces deviations and fewer lung problems

Solid feed intake per week (kg)



Solid feed intake (g/day)



WK	A=Standard 125g/L	B=Intensive start	C=140g/L milk
0-2	150	92	157
0-4	342	300	364
4-6	842	1135	920
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- Earlier intake solid feed: group B, intensified start
- Also earlier intake solid feed: 140g/L milk

Conclusions/recommendations



- First 4 weeks intensive fed calves, 25% more CMR (24kg versus 19kg)
→ 2 kg larger increase in weight
- First 4 weeks intensive fed calves or with 140g/L, resulted in thinner faeces, however no decrease in weight (limite intestinal tract reached?)
- The experimental group, which were given more calf milk in the first 4 weeks, didn't eat as much solid feed at the beginning, but afterwards their intake of solid feed was even higher
- Calves that were fed with higher concentrations of CMR showed no distinction the first 4 weeks; afterwards even more solid feed intake and increase in weight.
- **And, at the start, intensified CMR feeding schedule (and/or with more g/liter) brings benefit.**

Which feeding schedule do we recommend?



- A feeding schedule exists out of 3 phases:
 - Directly after birth up to maximal feed intake
 - Weight at birth – number of feedings per day
 - Maximal feed intake per day
 - What is the goal: maximal growth or saving feed cost?
 - Weaning phase
 - Compare energy: how many kg of compound feed are equal to 1 kg of CMR?

Recommended feeding schedule



Week	Powder gram in L	Liter/meal	Feeding / day	Grams / Day	Cumulative usage (KG)	Remark
	Colostrum	1,50*	Up to 4 times			Quick, quality, quantity
1	140	1,50	3	630	2,5	From day 5: water
2	140	2,75	2	770	8,0	Water, concentrate
3	140	3,75	2	1050	15,0	Water, concentrate, hay/straw
4	140	4	2	1120	23,0	Water, concentrate, hay/straw
5	140	4	2	1120	31,0	Water, concentrate, hay/straw
6	140	3,50	2	980	38,0	Water, concentrate, hay/straw
7	140	3	2	840	44,0	Water, concentrate, hay/straw
8	140	2,50	2	700	49,0	Water, concentrate, hay/straw
9	140	2	2	560	53,0	Water, concentrate, hay/straw
10	140	2	1	280	54	Water, concentrate, hay/straw

* Intake of calf milk replacer per week.

** The feeding schedule is a recommendation.

The development and the condition of the animals is the most important indicator.

Guidelines Feeding Schedule



- >1KG CMR a day as soon as possible.
Otherwise, the calf will lose growth potential and health, and solid feed intake potential
- Higher concentrations per liter can help
- After week 6-7, less CMR can stimulate solid feed intake

Take-home messages



What is the Schils 1Kg Growth Program:

- A calf has the potential to growth 1 kg per day the first 10 Weeks
- 1KG of CMR a day as soon as possible
- Solid feed intake is limited: (Week 3 \pm 300gr, KW5 \pm 500gr)
Calf must grow from CMR in the first week!
- The first 6 weeks should feed the calves intensive CMR
- More and good CMR will be payed back in first and second lactation
- More growth from CMR first 6 weeks results in calves that will eat more soild feed after weaning

Questions?

