VII International Congress On Cactus Pear & Cochineal

Effect of graded levels of prickly pear pads on sheep performance

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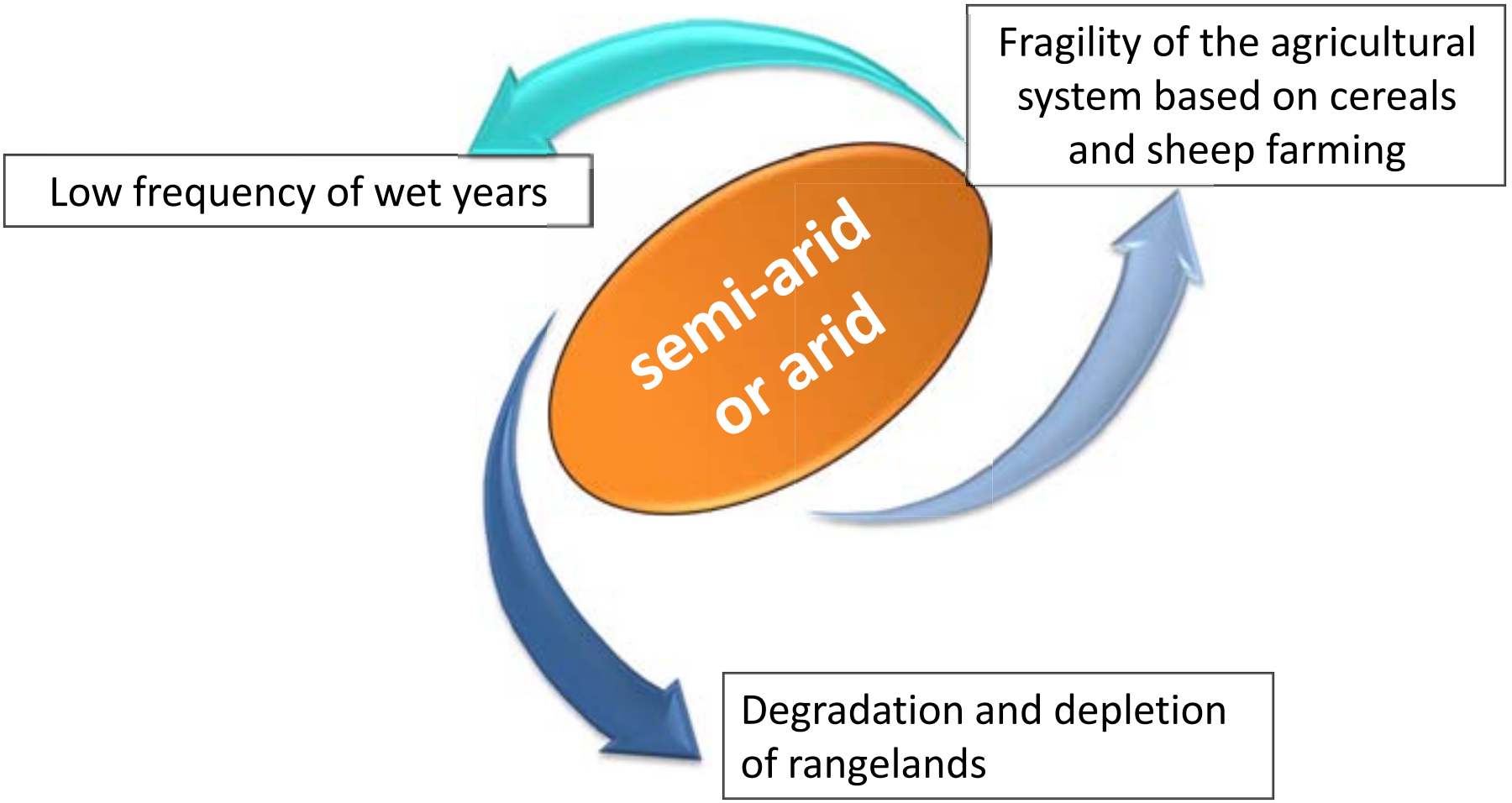
Context


Low frequency of wet years
Fragility of the agricultural system based on cereals and sheep farming
semi-arid or arid
Degradation and depletion of rangelands

Production of biomass with high water use Efficiency

Root system that helps fight against the erosion of land

Barrier to sand transported by wind

Objectives

-1- characterize the nutritive value of cactus pads;

-2- define the optimum level of incorporation of cactus pads for lactating ewes and young growing-fattening lambs

Methodology: Characterization of the nutritive value of pads

Samples were collected from the field for :

- each type of pads (spiny, spineless) and
- each age category (young, one year old and older)
- chemical analysis: DM, Min., CP, ADF.

Digestibility of diets was made.

Methodology: Diets

Composition of diets (% of total DM)

Aliments	0%C	15%C	30%C	45%C
Cactus pads	0	15	30	45
Straw, chopped	30	25	20	15
Barley grain	24	24	24	24
Wheat bran	30	20	10	0
Sunflower meal	14	14	14	14
Min.Vit.	2	2	2	2

Methodology : Diets

Supply of UFL, PDI and CF of the diets

	0%C	15%C	30%C	45%C
UFL /kg DM	0.76	0.76	0.76	0.76
PDI / UFL	119	107	95	90
Crude Fiber (%)	21.32	19.82	18.31	17.22

Methodology : Diets

- ✓ Pads harvested one day left to air dry.
- ✓ Cut into small pieces (≈ 4 to 6 cm in length) before being mixed with other components of the diet.
- ✓ The ration is completely mixed
- ✓ Distributed *ad lib*. twice daily at 8 and 15h.

Methodology: Ewes dairy production

Number of ewes : 40

Milk production: amount of milk produced was estimated by the method of weighing lambs before and after milk suckling (PAAT).

Measurement : done once a week.

Body weight: every 2 weeks.

Methodology: Dairy milk production

Water consumption: Water was available in buckets *ad lib*. The amount of water drunk was measured.

Intake: Feed refused each day was weighed the next morning.

Intake was determined by difference between the amount offered and the one refused.

Methodology: Fattening of lambs

- Animals: 44 Timahdit lambs.
- Duration: 3.5 months, 2 weeks of adaptation.
- weighing at the beginning, the end of the trial and at regular intervals of 3 weeks;
- amounts of water drunk
- Intake
- Carcass traits

Characterization of the nutritional value of pads

Nutritive value of spiny and spineless varieties of cacti pads

	Varieties	
	Spiny	Spineless
DM	12,32	11,98
Min	19,85a	21,16b
Crude Protein	7,47a	6,07b
ADF	20,52a	19,25b

Characterization of the nutritive value of cactus pads

Evolution with age of the nutritional value of cactus pads

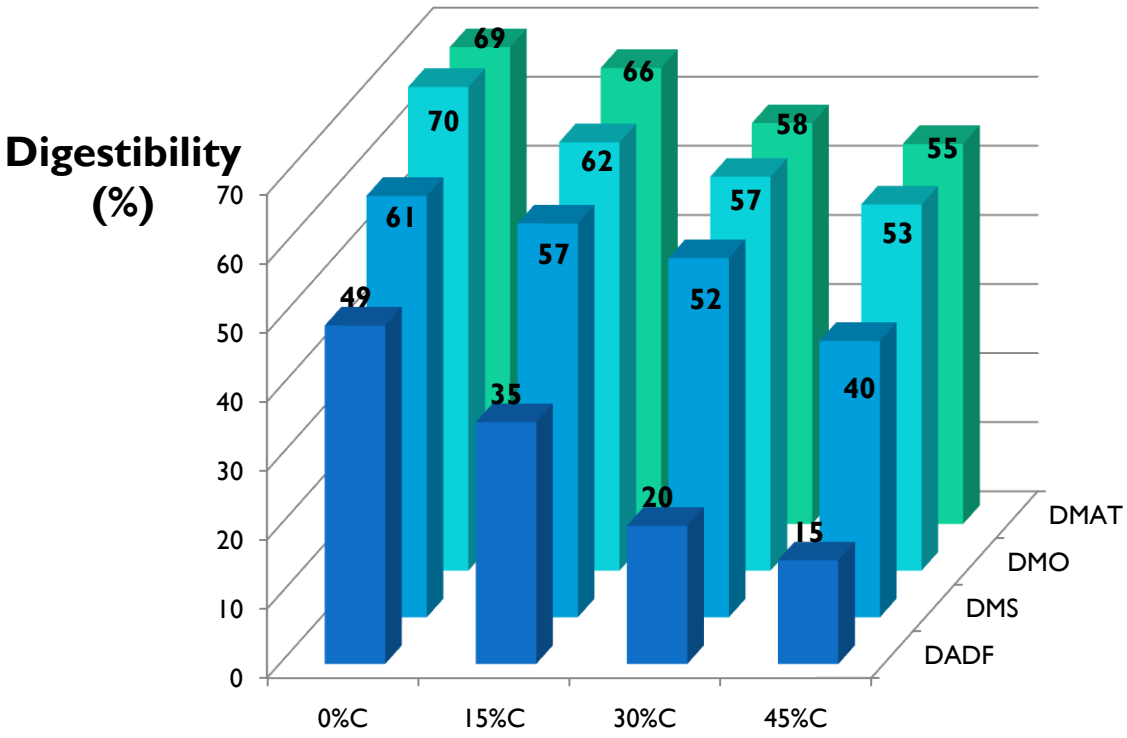
	Age		
	Young	One year old	Old
DM	10,13[a]	12,23[b]	14,1[c]
Min	19,09[a]	19,24[a]	23,18[b]
CP	10,07[a]	5,79[b]	4,45[c]
ADF	18,29[a]	20,70[b]	20,66[b]

Characterization of the nutritional value of cactus pads

Seasonal evolution of the nutritive value of cactus pads

	Saison		
	Spring	Summer	Fall-winter
DM	10,63[a]	15,34[b]	10,48[a]
Min.	18,36[a]	20,17[b]	22,98[c]
Crude Protein	7,56[a]	5,61[b]	7,14[a]
ADF	18,44[a]	19,33[a]	21,88[b]

Digestibility of diets



Effect of diet on digestibilities of DM, OM, CP and ADF

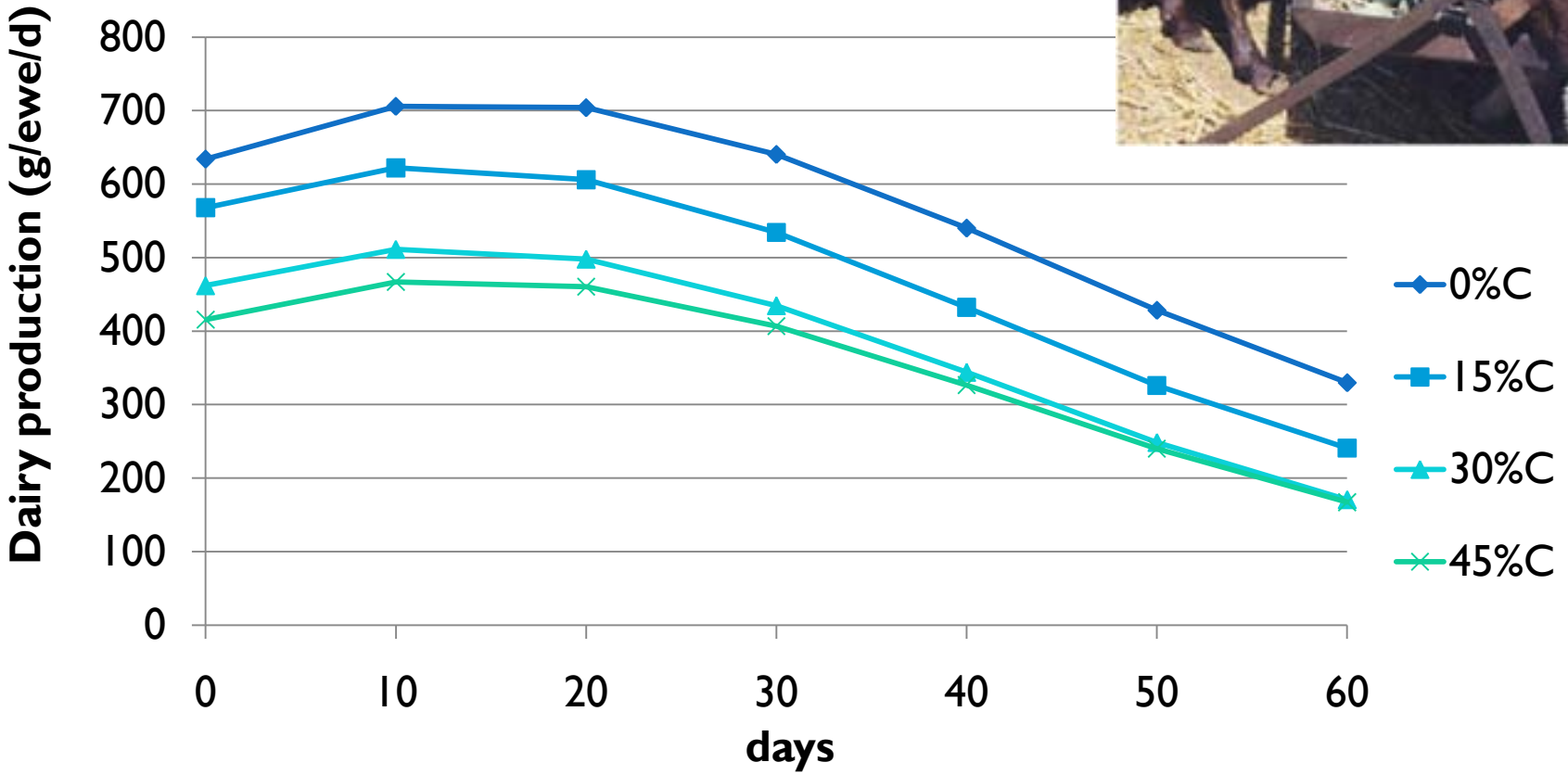
Ewes dairy production

Effect of incorporation of cactus pads on performance of ewes

	Diet			
	0%C	15%C	30%C	45%C
Initial BW (kg)	36.77	36.98	34.10	33.58
Final BW (kg)	32.92	31.48	29.82	31.34
BW loss (kg)	3.85	5.50	4.28	2.24
Intake (kg DM/d)	1.49	1.10	0.65	0.52
Dairy production(1) (kg)	34.50	28.78	23.16	21.59
Eau bue (ml/ j)	1425	1034	623	411

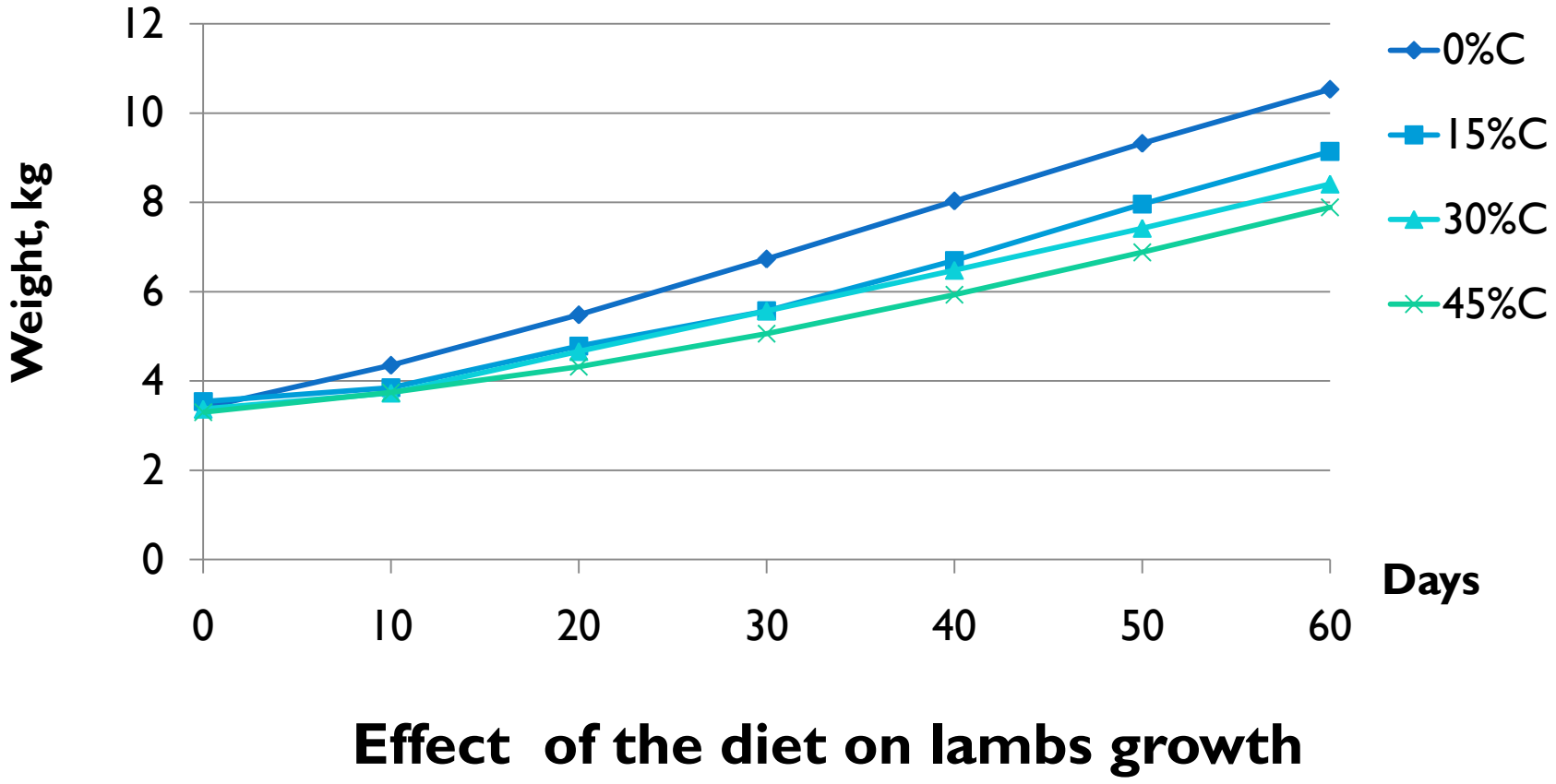
(1) For a duration of 60 d

Ewes dairy production

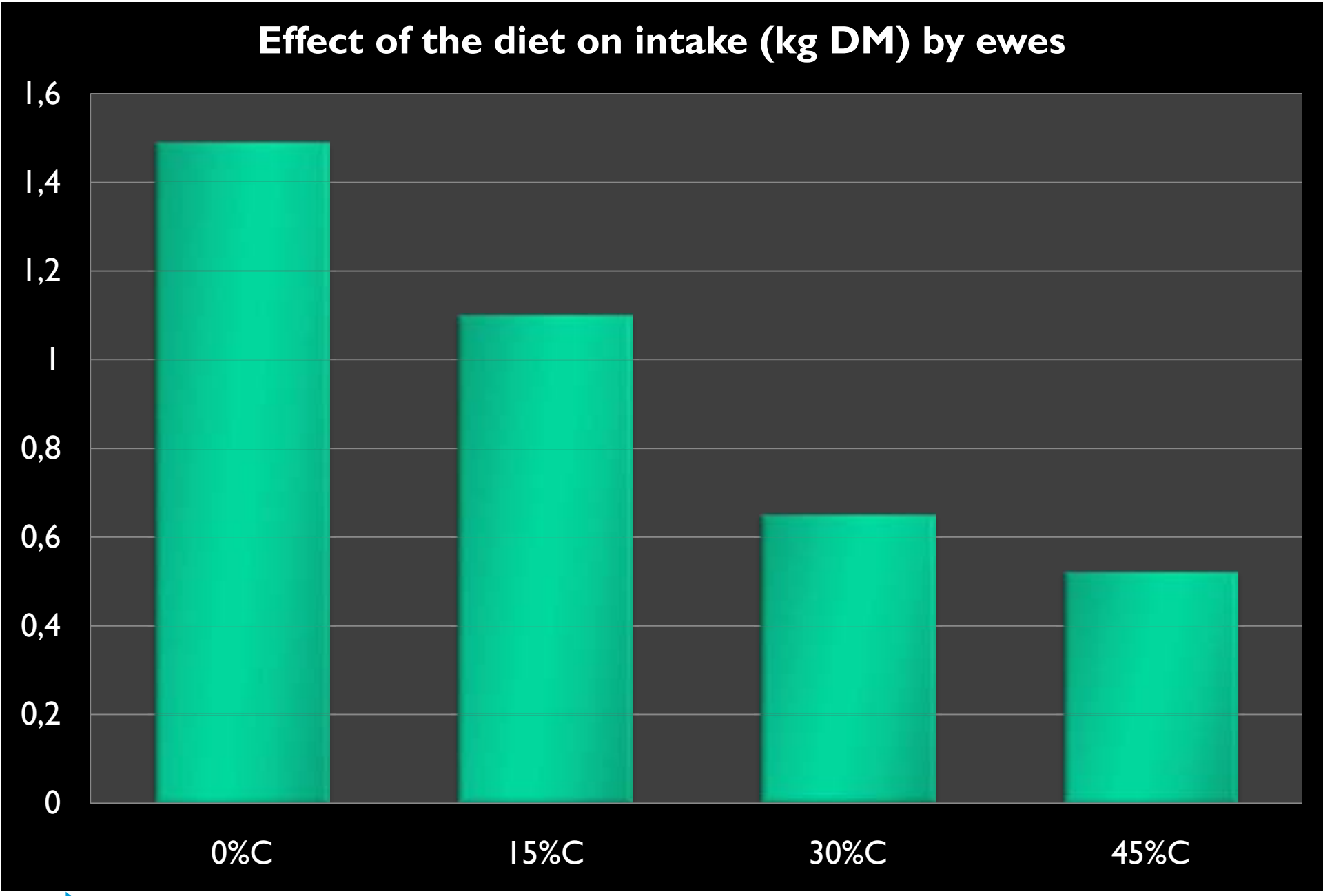


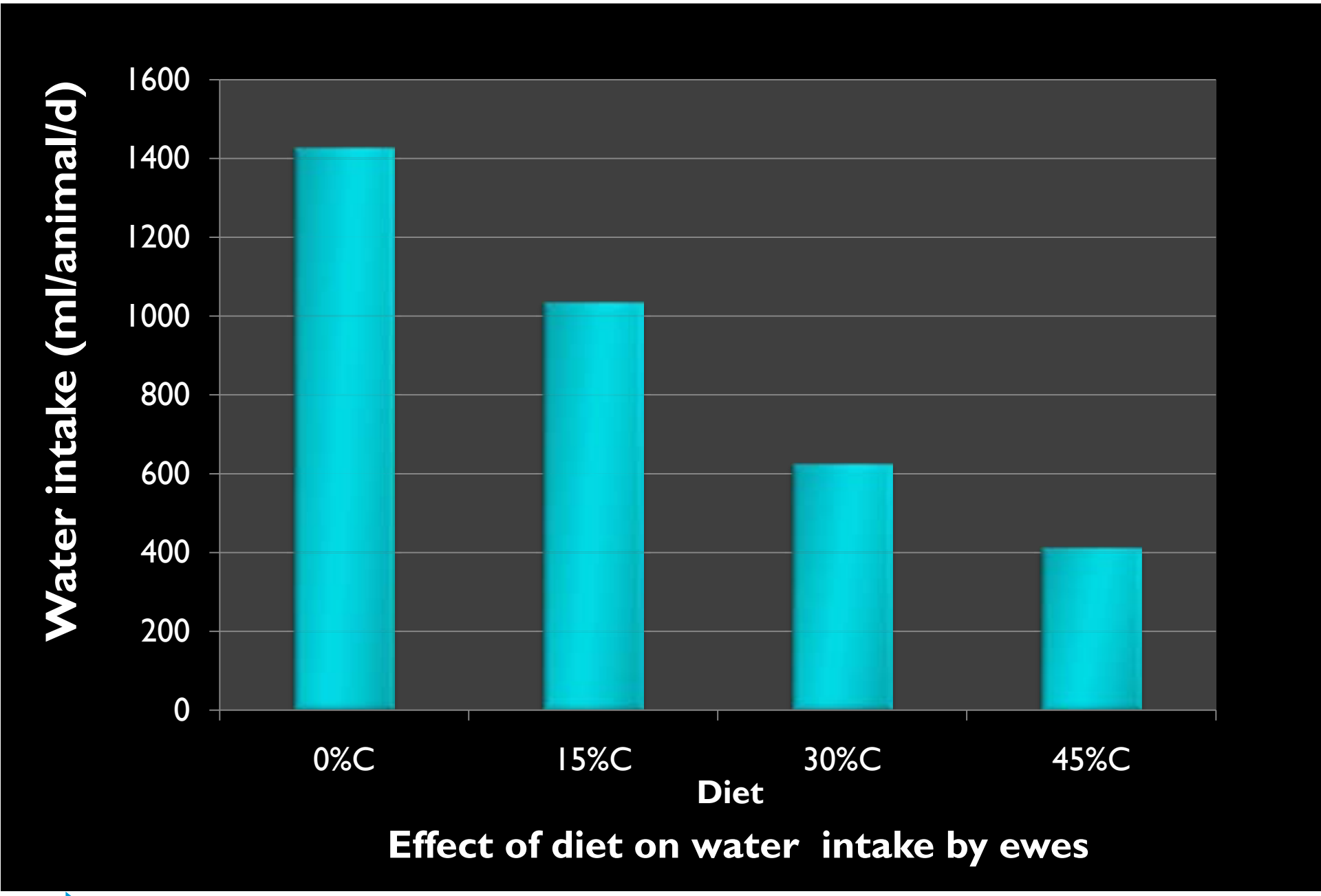
Effect of the diet on ewes dairy production

Ewes dairy production



Effect of the diet on lambs growth


Effect of the diet on intake (kg DM) by ewes
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
0%C
15%C
30%C
45%C



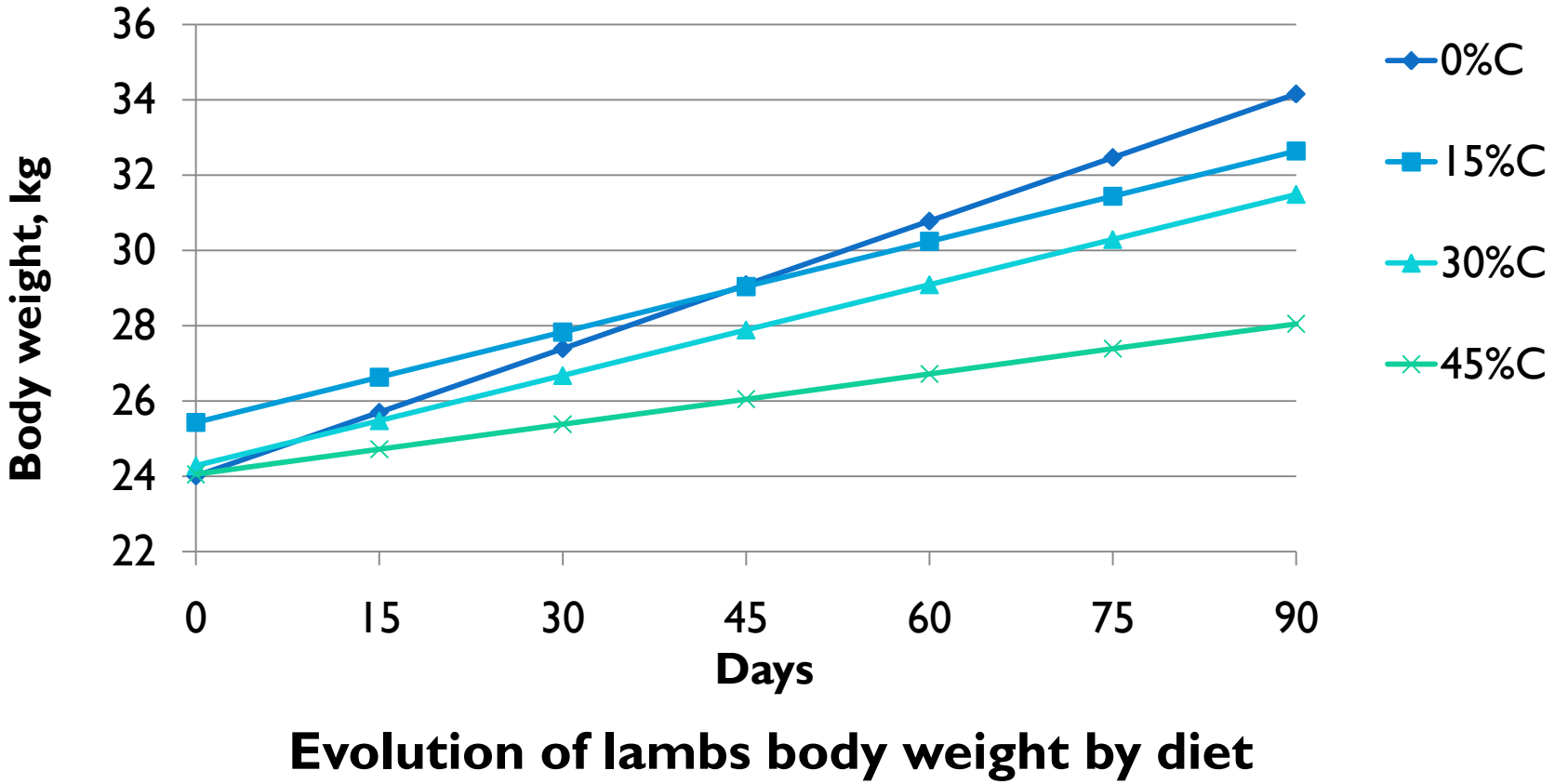
Effect of diet on water intake by ewes

Fattening of lambs

Effect of incorporation of cactus pads on performance of lambs

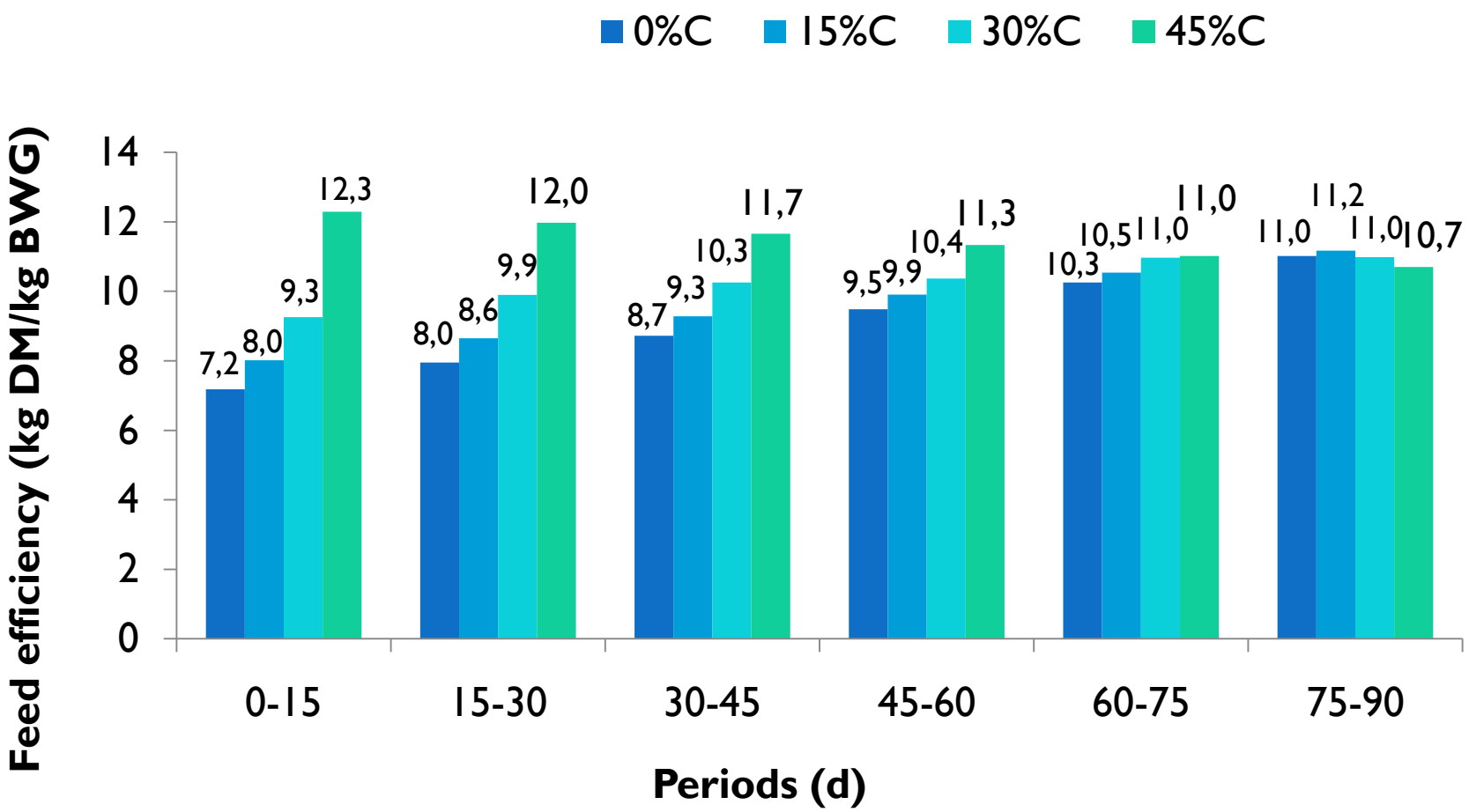
	Diets			
	0%C	15%C	30%C	45%C
Number of lambs	11	11	11	11
Initial BW(kg)	24.09	24.92	24.20	23.98
Final BW (kg)	34.10	32.10	30.36	27.88
Duration (j)	90	90	90	90
ADG (g)	112^{a}	80^{b}	69^{c}	44^{d}
Intake (kg DM/ j)	1.02	0.81	0.72	0.50
Feed efficiency (kg DM/ kg of BW gain)	9.24^{b}	10.28^{a}	10.75^{a}	11.50^{a}
Water intake (ml/ d)	1882	1160	568	452

Fattening of lambs



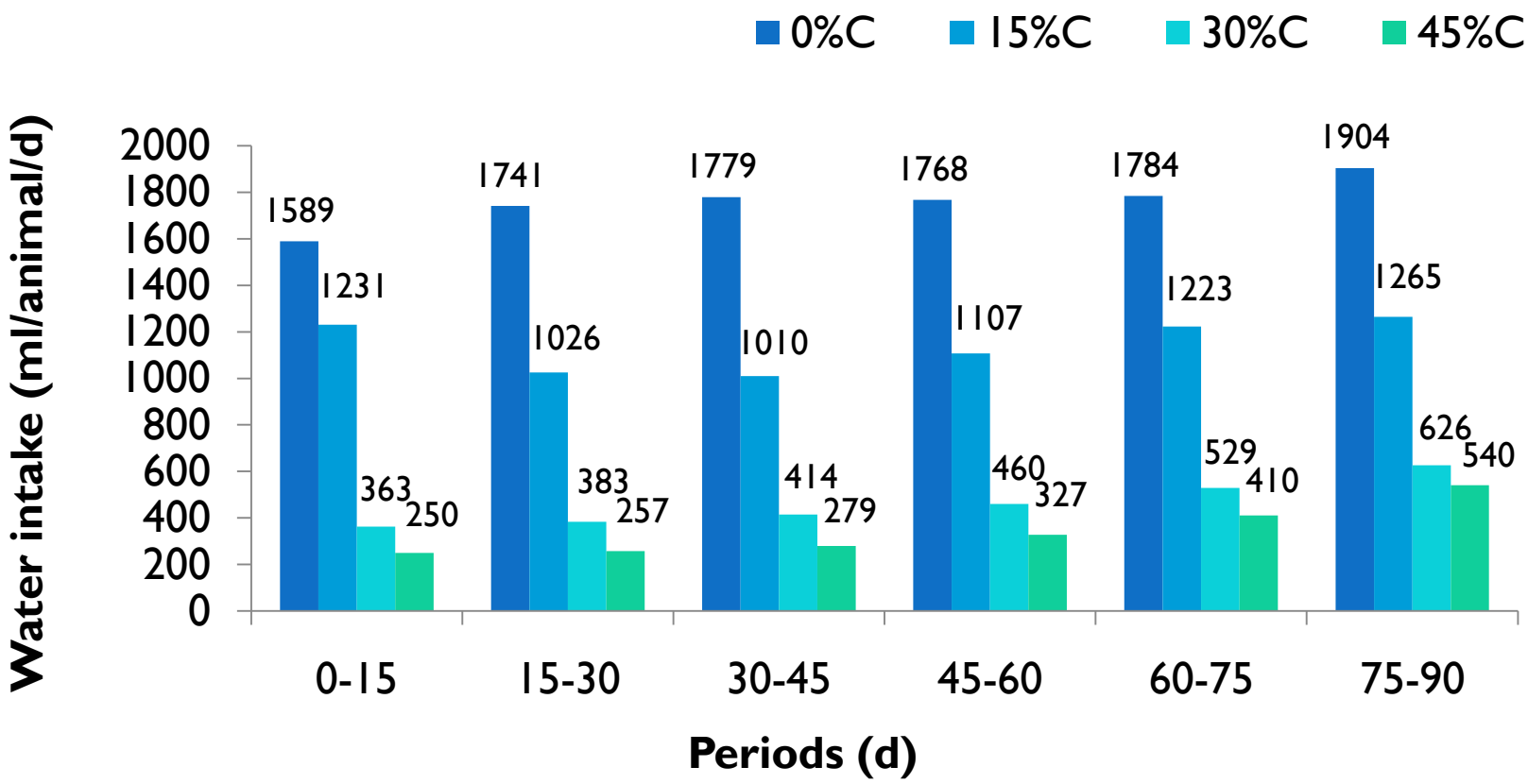
Evolution of lambs body weight by diet

Fattening of lambs



Changes in feed efficiency with time and diet

Fattening of lambs



Effect of diet on water consumption

Fattening of lambs

Effect of diet on carcass dressing

	diets			
	0%C	15%C	30%C	45%C
Number of animals	3	3	3	3
BW before slaughtering (kg)	33.6	31.7	35.1	33.3
Carcass weight (kg)	17.9	16.4	17.4	15.8
Carcass dressing (%)	52.8	51.8	49.6	48.0

Fattening of lambs

Effect of incorporation of cactus pads on some offal components

	Régime			
	0%C	15%C	30%C	45%C
Number of animals	3	3	3	3
Rumen full, kg	2.52^{c}	3.17^{b}	3.59^{b}	4.19^{a}
Rumen empty, kg	0.55	0.60	0.63	0.67
Intestines full, kg	2.52	3.24	2.72	3.48
Mesenteric fat, kg	0.85	1.29	1.00	1.37

Fattening of lambs

Effect of incorporation of cactus pads on adipose tissue

	Diet			
	0%C	15%C	30%C	45%C
Number of lambs	3	3	3	3
Mesenteric fat (kg)	0.85	1.29	1.00	1.37
Mesenteric fat (% carcass weight)	4.93	7.63	5.72	8.20

Fattening of lambs

Effect of incorporation of cactus pads on feed cost
(Dh/kg of Body weight gain)

Price	Diet			
DH/kg of cactus pad	0%C	15%C	30%C	45%C
0.00 Dh	15.98	7.30	3.32	3.18
0.15 Dh	15.98	8.33	5.69	4.66
0.30 Dh	15.98	9.25	6.99	6.26

Conclusions

Overall, performance of animals decreased with level of cactus pads. Nevertheless, it proved that with diets tested, the performances were all positive:

- milk production and hence growth of young suckling lambs;
- growth and not fall yearling weight;
- carcass similar to those produced from conventional rations;
- significant decrease in the cost of producing meat.

Conclusions

This work has shown that cactus pads, which are traditionally considered only a survival feed, can even lead to production (70 g/d in growing lambs), if properly supplemented, especially in:

- protein to ensure a minimum of 90 g PDI / UF;
- fiber , so as to provide a minimum of CF (17%) for proper rumination.