

MPO National Congress 2017



Gil Inbar, Global Industry Manager, Dairy

Agenda:

- Milk price trends worldwide
- Benefits of using climate control systems
- Munters dairy application and advanced products

Self Introduction

- **Name** – Gil Inbar
- Citizen of Israel
- **Age** – 47
- **Education** - Master Degree in dairy Nutrition, Fertility and Management, Hebrew University of Jerusalem.
- **Work experience** – CEO of TH Milk, (Vietnam) for 6 years 30,000 cows.
- Project Director and GM of HAGL Agri (Vietnam) 8,000 cows.
- Consultant to global investment companies.
- Consultant for dairy farms and project worldwide.
- Dairy farm GM (Israel) 1200 cows.
- Dairy farm GM (India).
- Dairy segment project director (Botswana Africa) 12,000 cows.
- Dairy GM WMG (Ukraine) 30,000 cows.



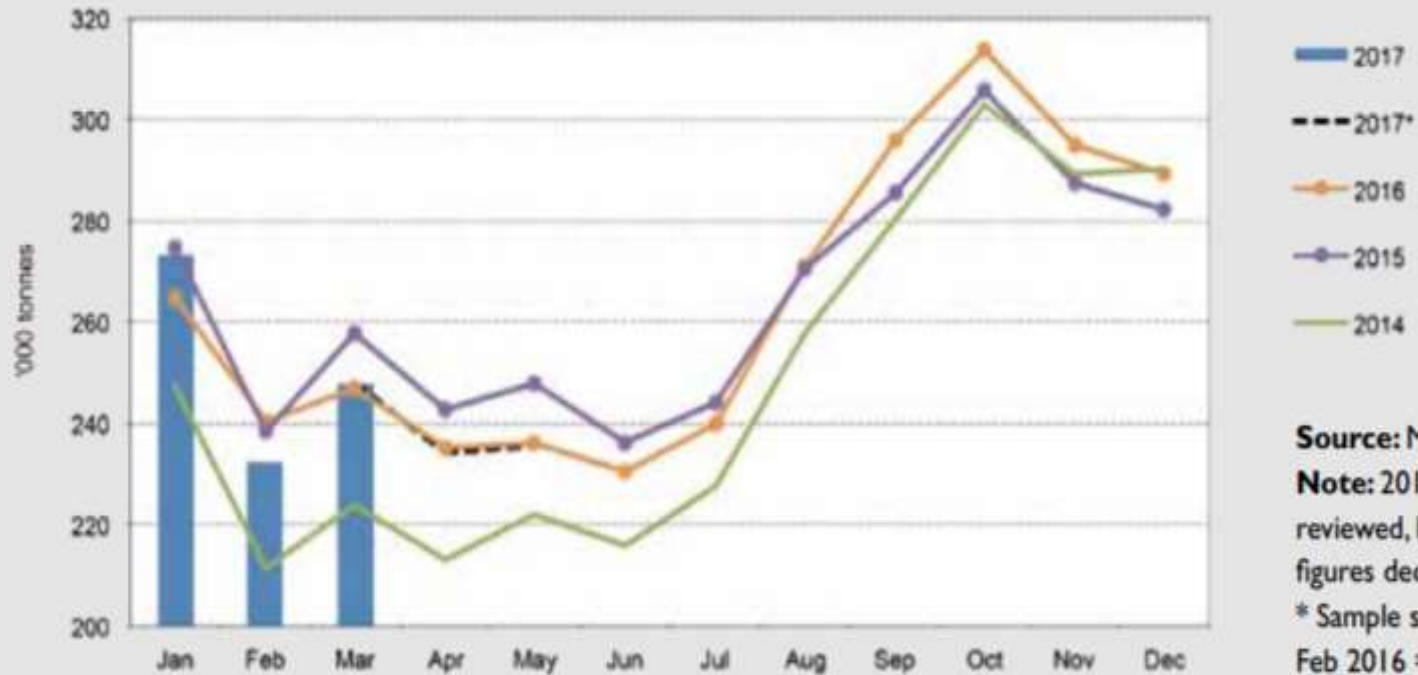
Milk price around the world

GDT Price Index over 10 years

The GDT Price Index is calculated from the total quantity sold in a Trading Event across all products, contract periods and sellers. For more information on the price index calculation, please go to our "How GDT Events work" page.



Milk production in SA past 3 years



Source: Milk SA statistics.

Note: 2014 – Mar 2017 reviewed, based on total figures declared to Milk SA
* Sample survey.
Feb 2016 = 29 days.

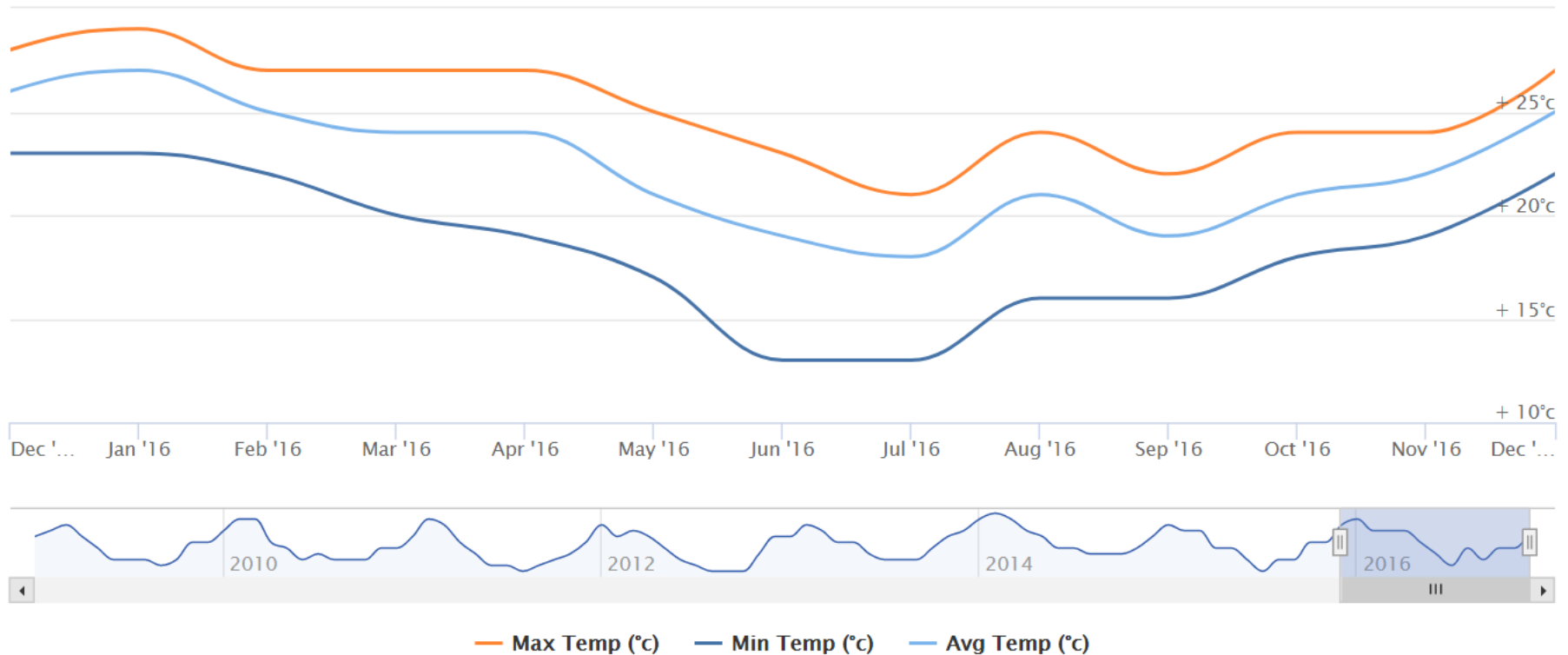
Temp along the years

Port Elizabeth, Eastern Cape

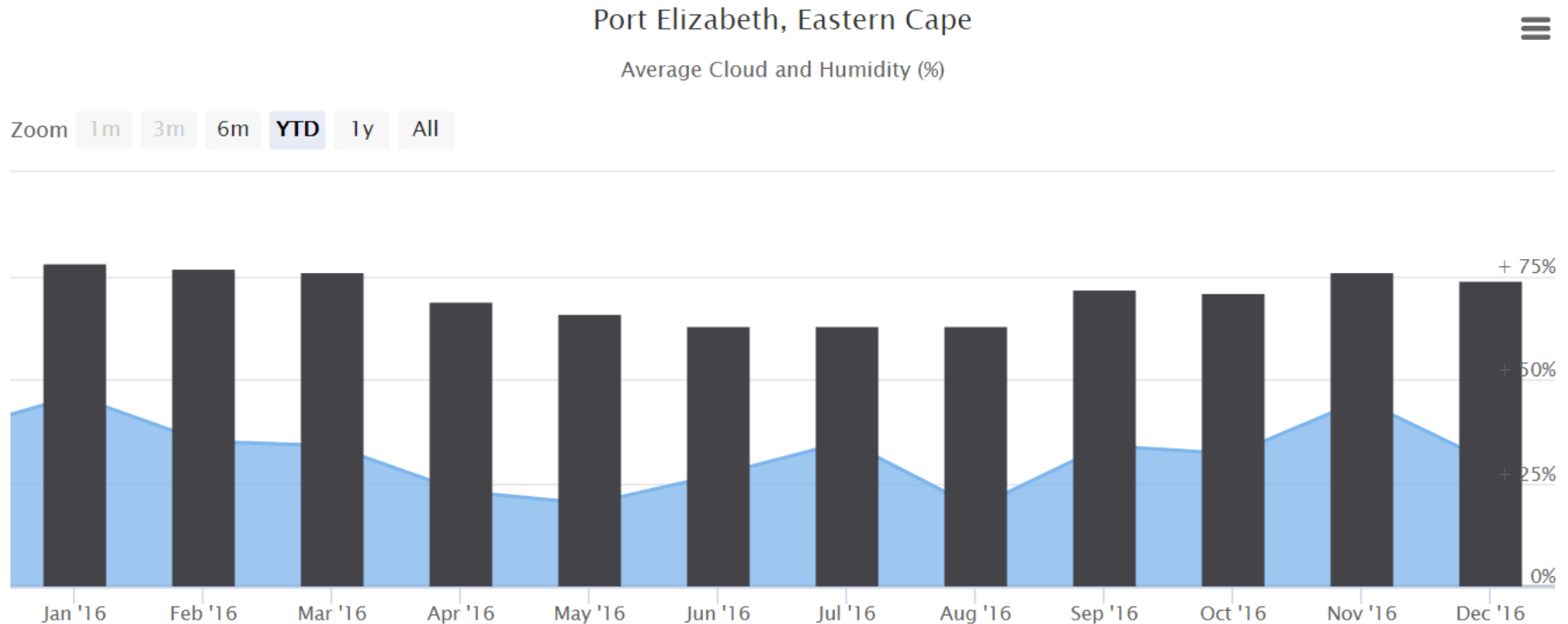
Max, Min and Average Temperature (°C)



Zoom 1m 3m 6m YTD **1y** All



Port Elizabeth humidity over the years



THI index

Temperature Humidity Index (THI)									
Relative Humidity %									
C	20	30	40	50	60	70	80	90	100
22	66	66	67	68	69	69	70	71	72
24	68	69	70	70	71	72	73	74	75
26	70	71	72	73	74	75	77	78	79
28	72	73	74	76	77	78	80	81	82
30	74	75	77	78	80	81	83	84	86
32	76	77	79	81	83	84	86	88	90
34	78	80	82	84	85	87	89	91	93
36	80	82	84	86	88	90	93	95	97
38	82	84	86	89	91	93	96	98	100
40	84	86	89	91	94	96	99	101	104

No heat stress

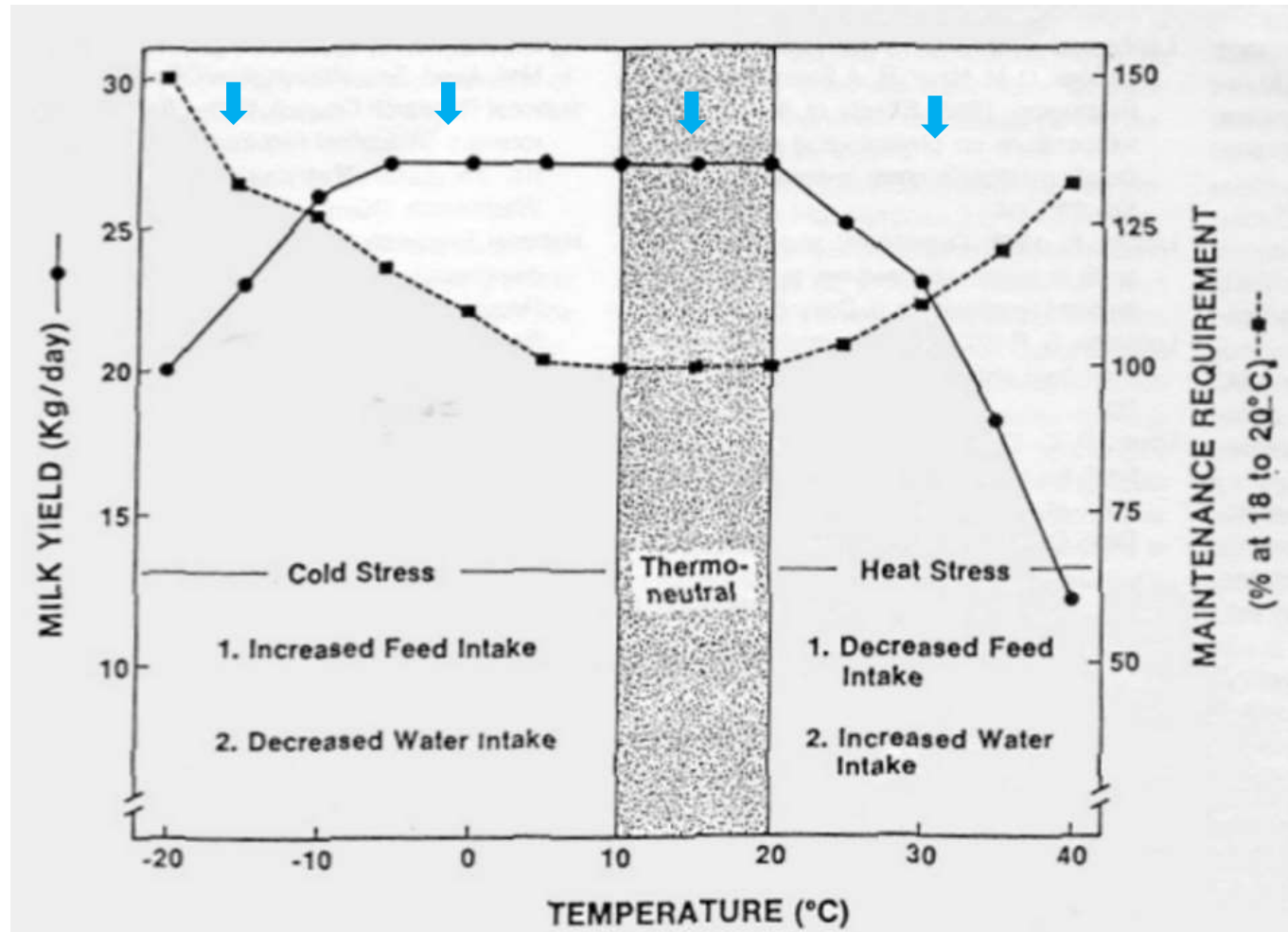
Moderate heat stress

Severe heat stress

Dead cows



Cows Feed efficiency under heat and cold stress

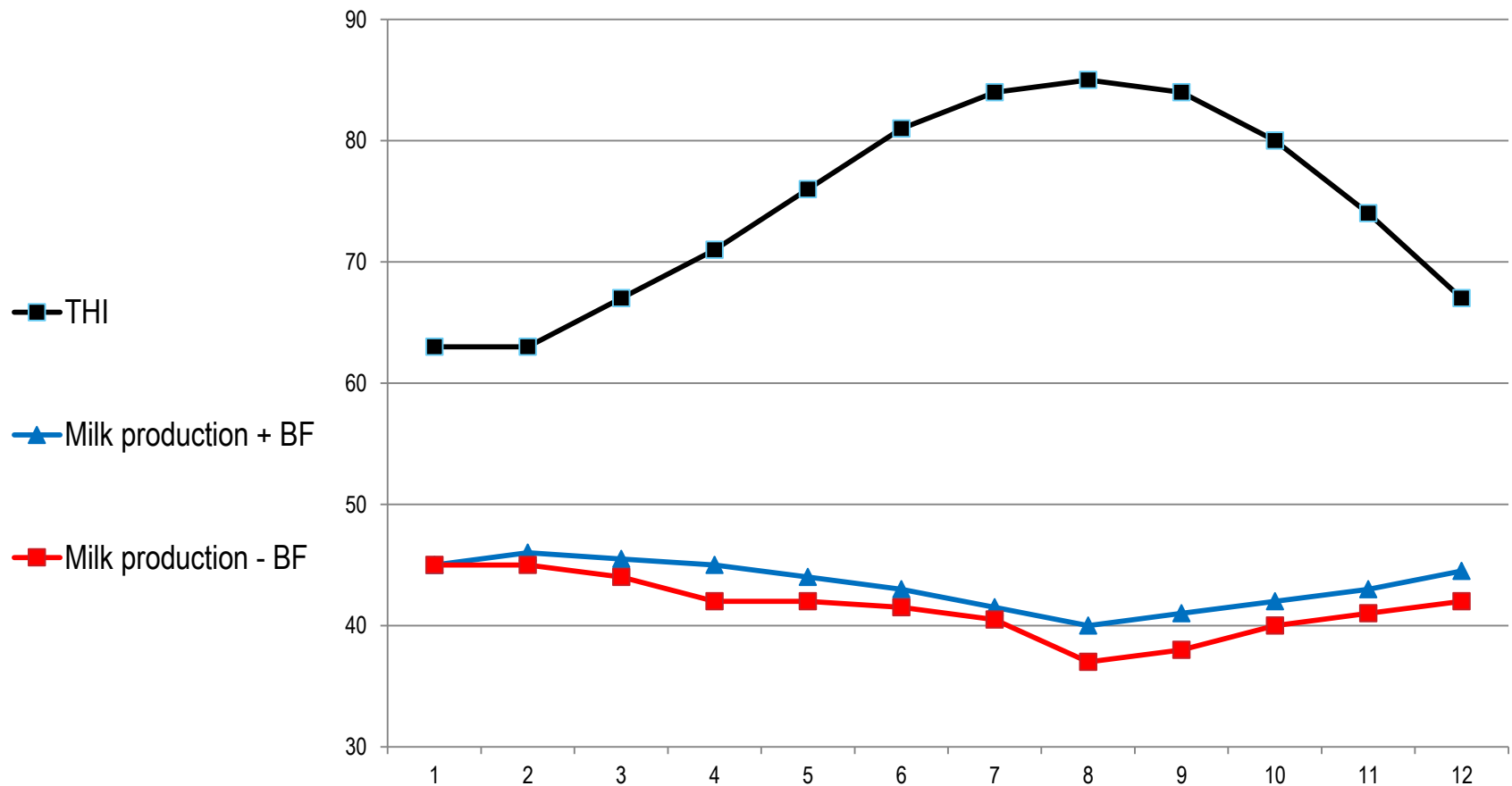


Trial 1 process

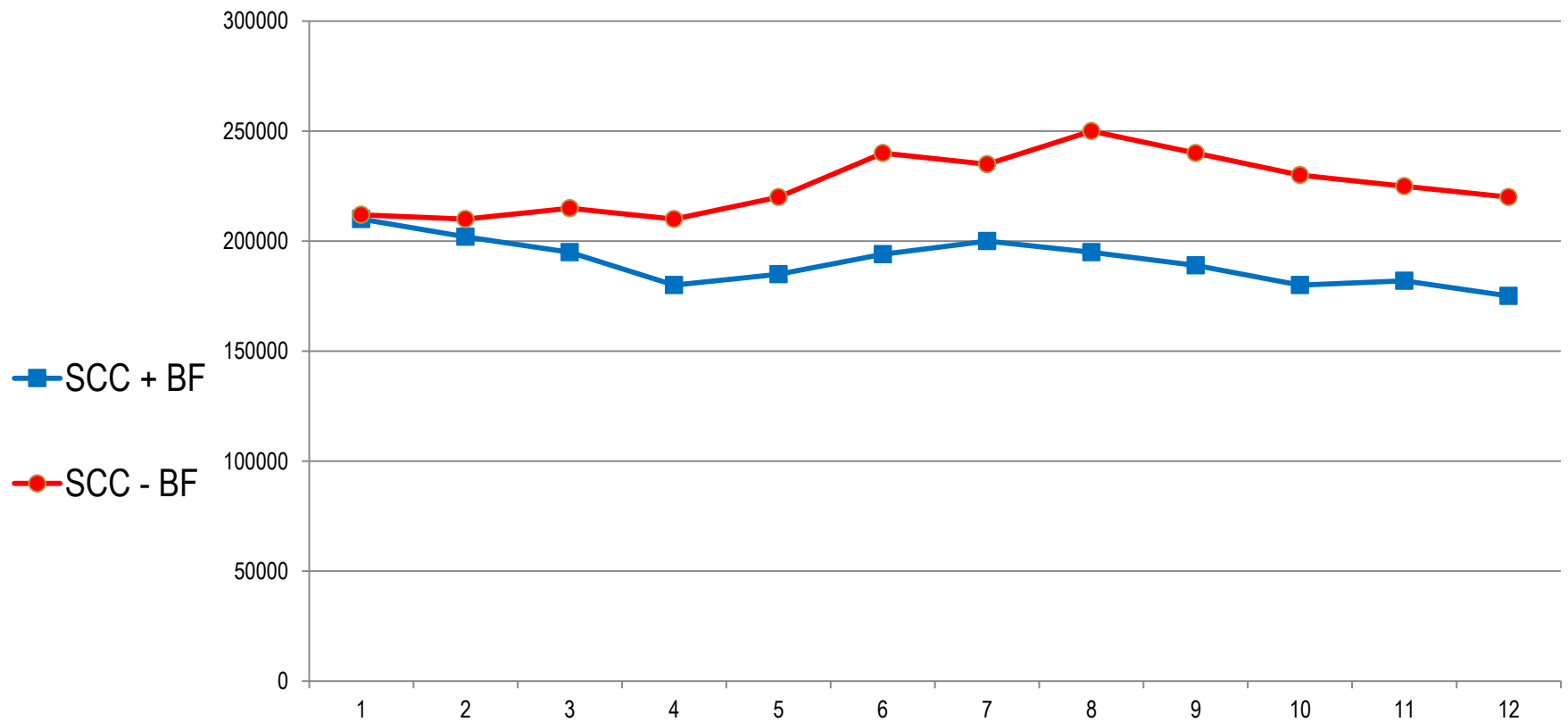
- 2 groups of 100 cows, one with BF and one without BF.
- Free stall system.
- One year of trial: Jan 2016 – Jan 2017.
- Dairy farm in Israel.
- Breeze fans, 4.5 meter, working 100% speed 24/7.
- Parameter under investigation
 - Milk production
 - Fat and protein
 - SCC
 - Lameness
 - Fertility



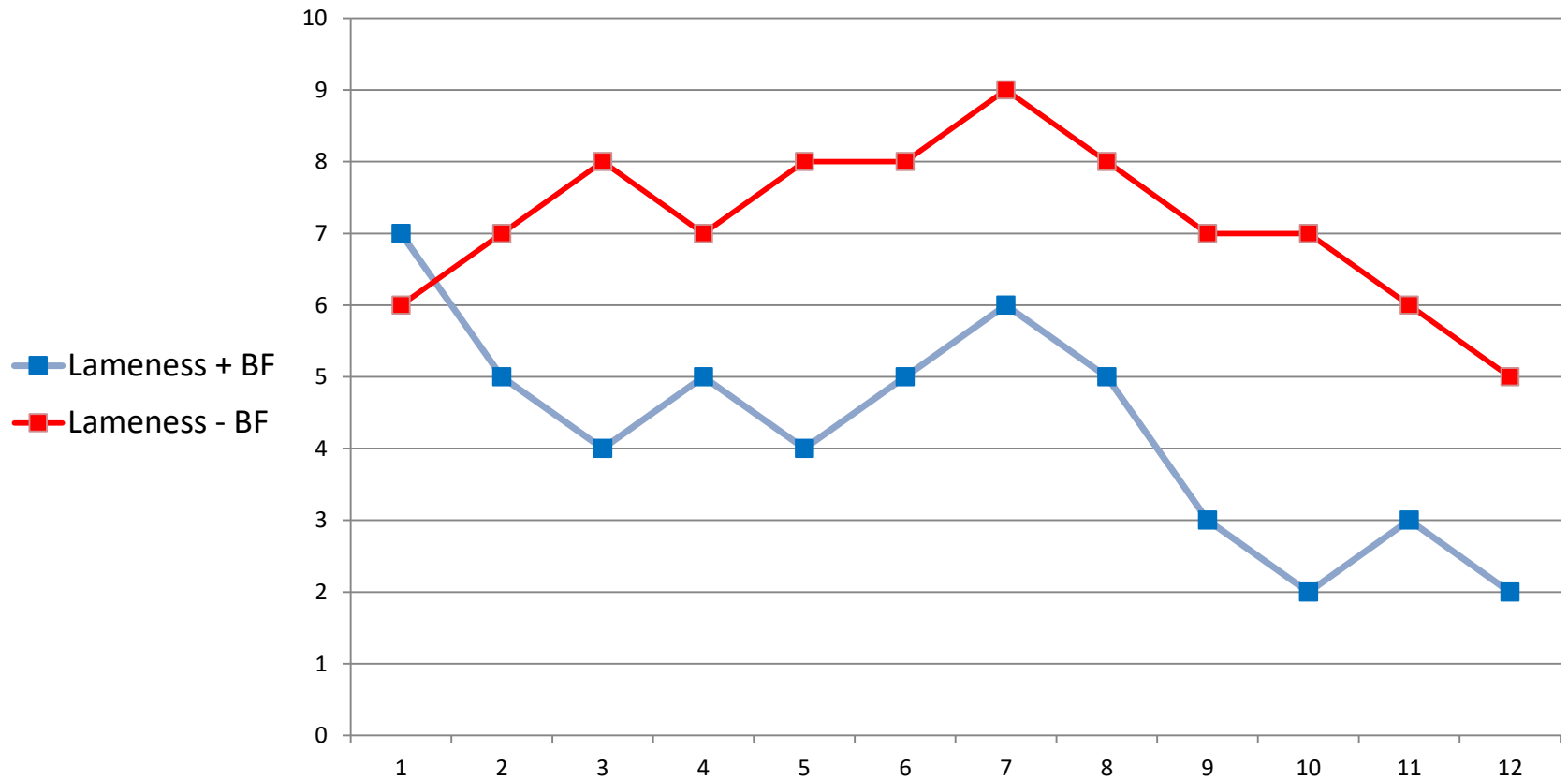
Milk production, cows with or without breeze fans at resting area



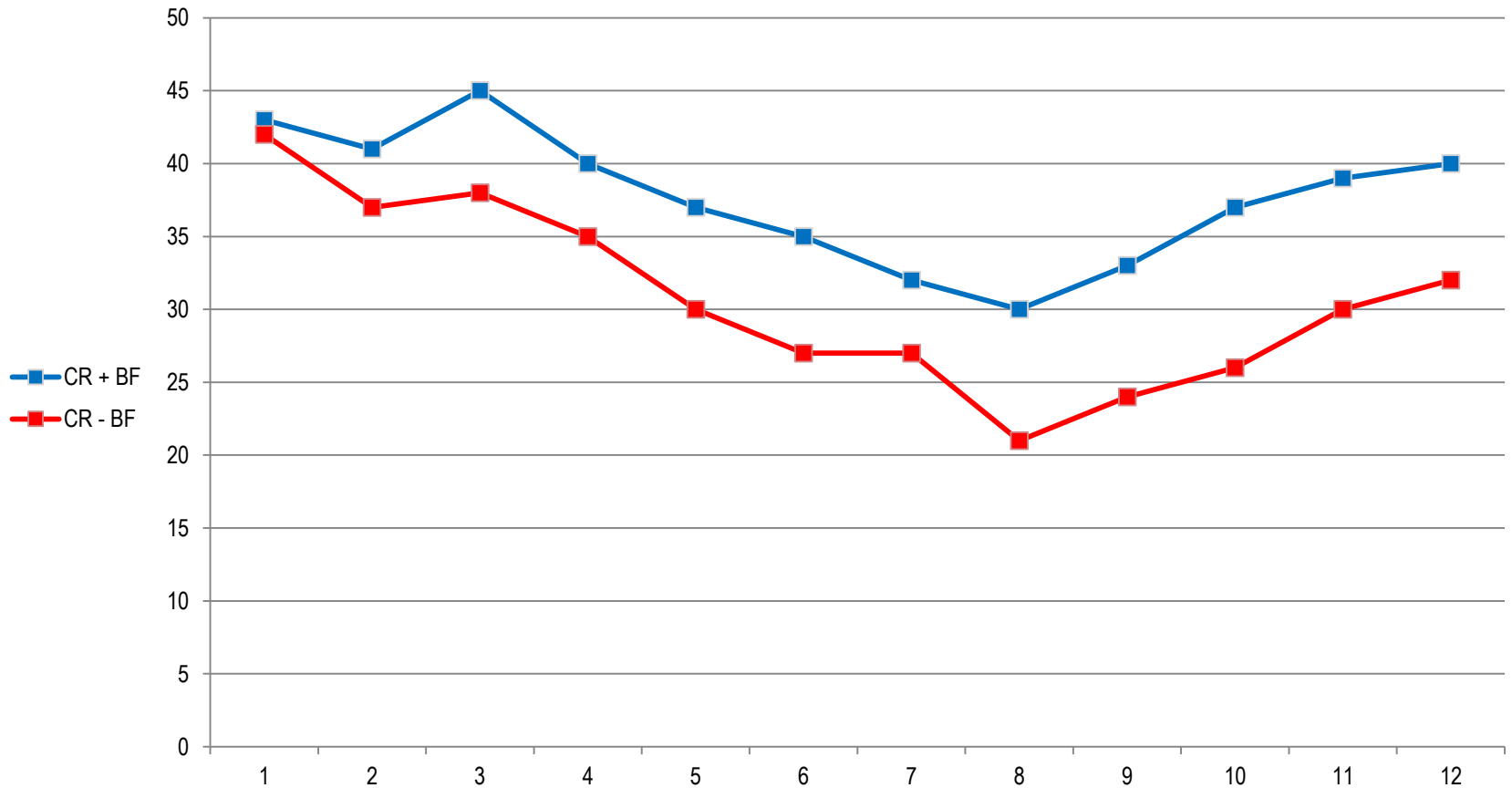
SCC in cows with or without breeze fans at resting area



Lameness cases cows with or without breeze fans at resting area



Fertility (CR) with or without breeze fans

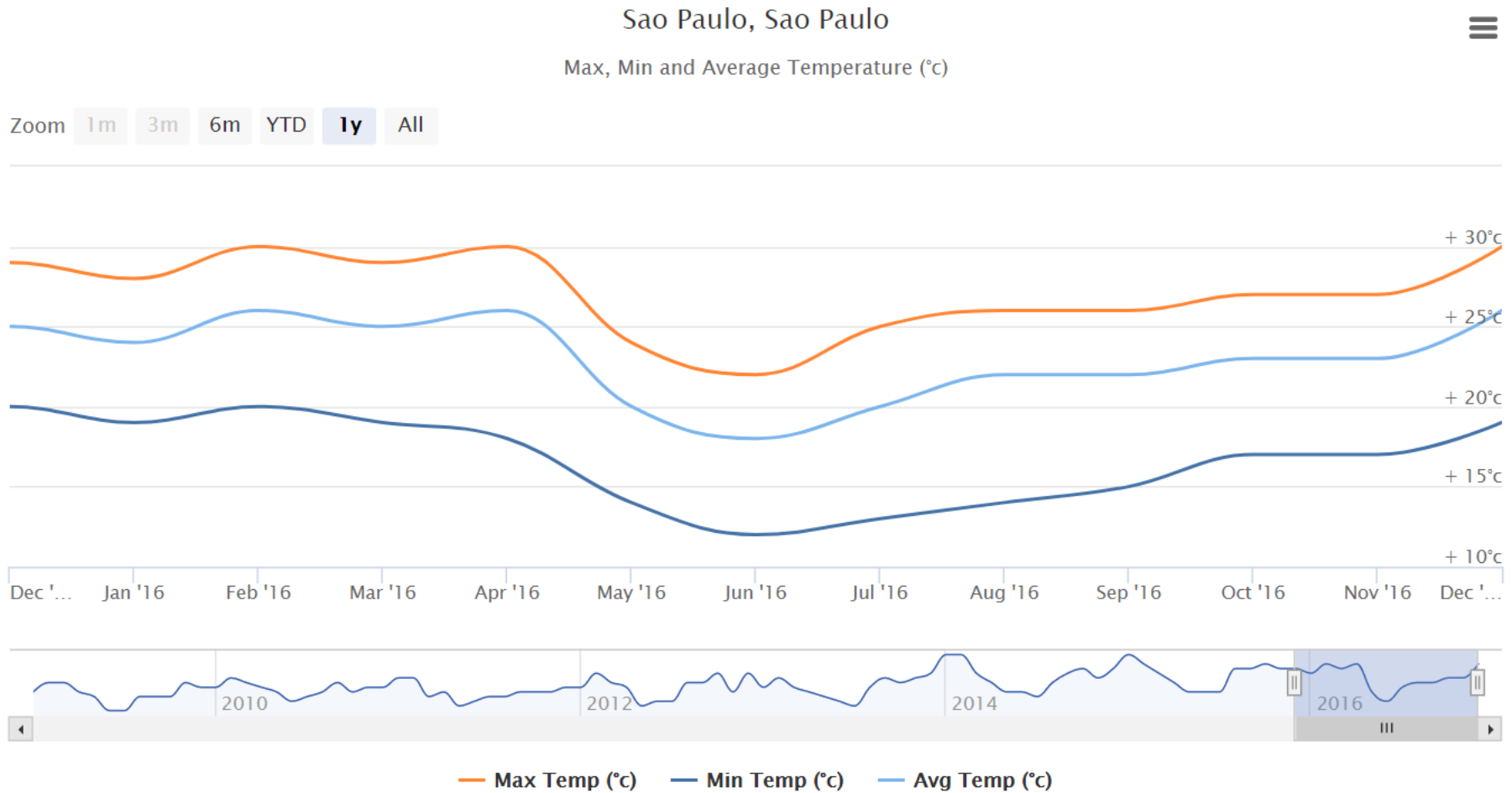


Financial benefit

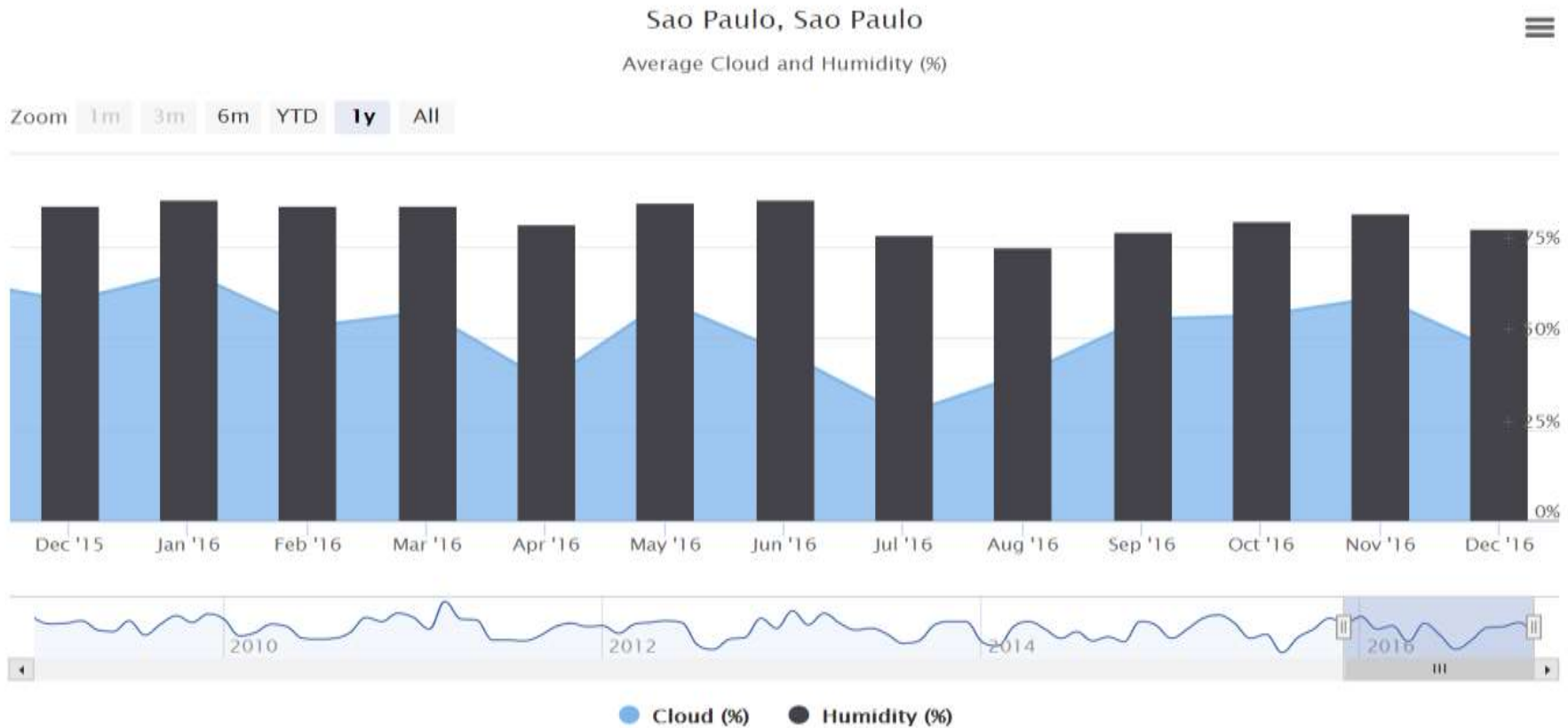
- From milk production = $2\text{lit} \times 305\text{days} = 605\text{ lit} \times 0.3\text{USD} = 200\text{USD}$
- From fertility = $20\text{days not pregnant} \times 3\text{USD} = 60\text{USD}$
- From SCC = $0.005 \times 11,000\text{lit} = 55\text{USD}$
- From lameness = $3\text{case} \times 500/100 = 15$

- Total = $200 + 60 + 55 + 15 = 330\text{ USD per cow per year}$
- Investment and Expenses = 150 USD
- **Total profit of 180 USD cow/year**
- **Pay back = 1 years**

Sao Paulo temperature



Sao Paulo Humidity



Trial 2

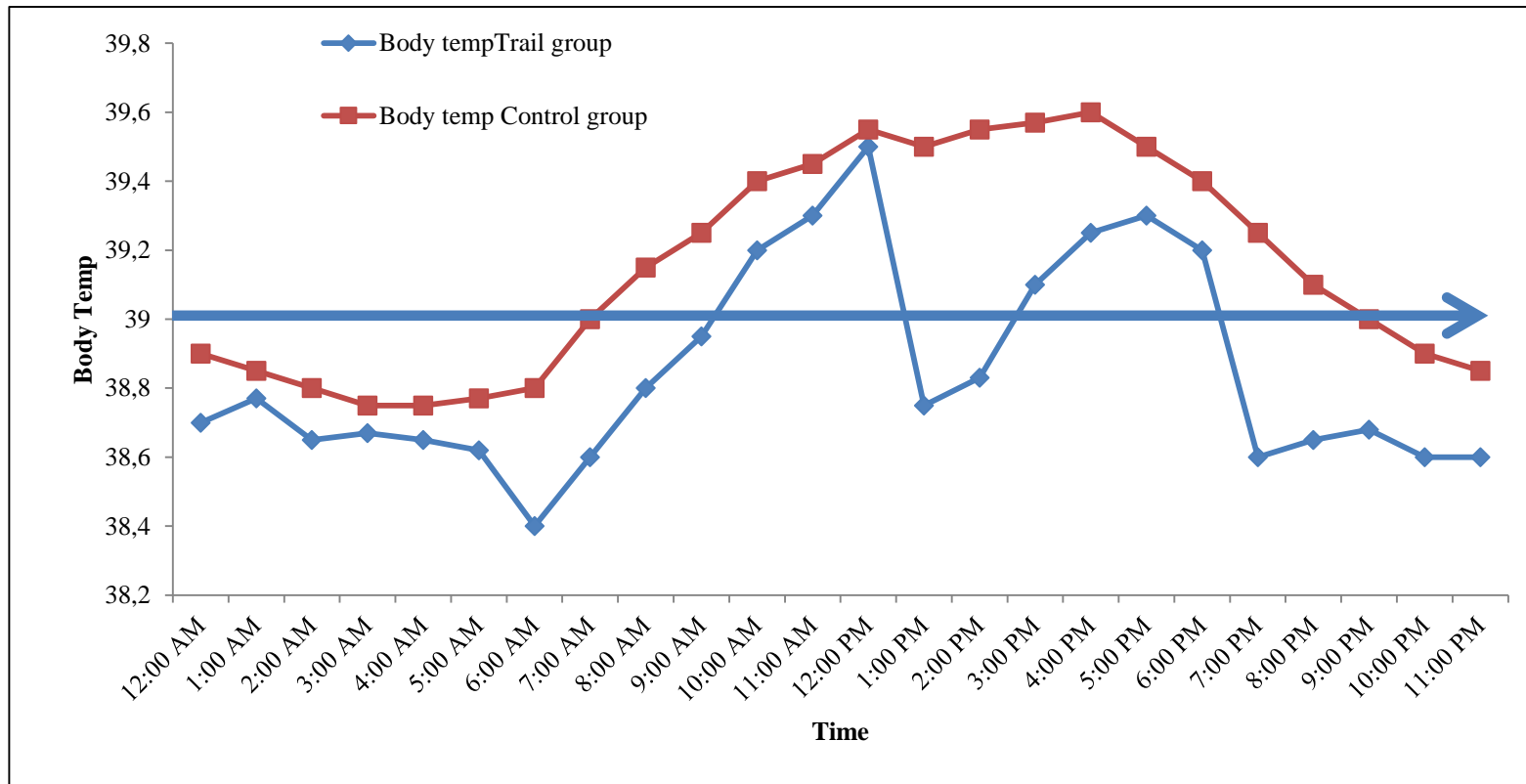
- The trial was done in Brazil, on pasture herd
- 2 groups of 200 milking cows
- 1 group received 1 hour of cooling before milking X 3 times a day.
- 1 control group no cooling.
- Period: 1/10/2015 - 31/12/2016

Parameters checked

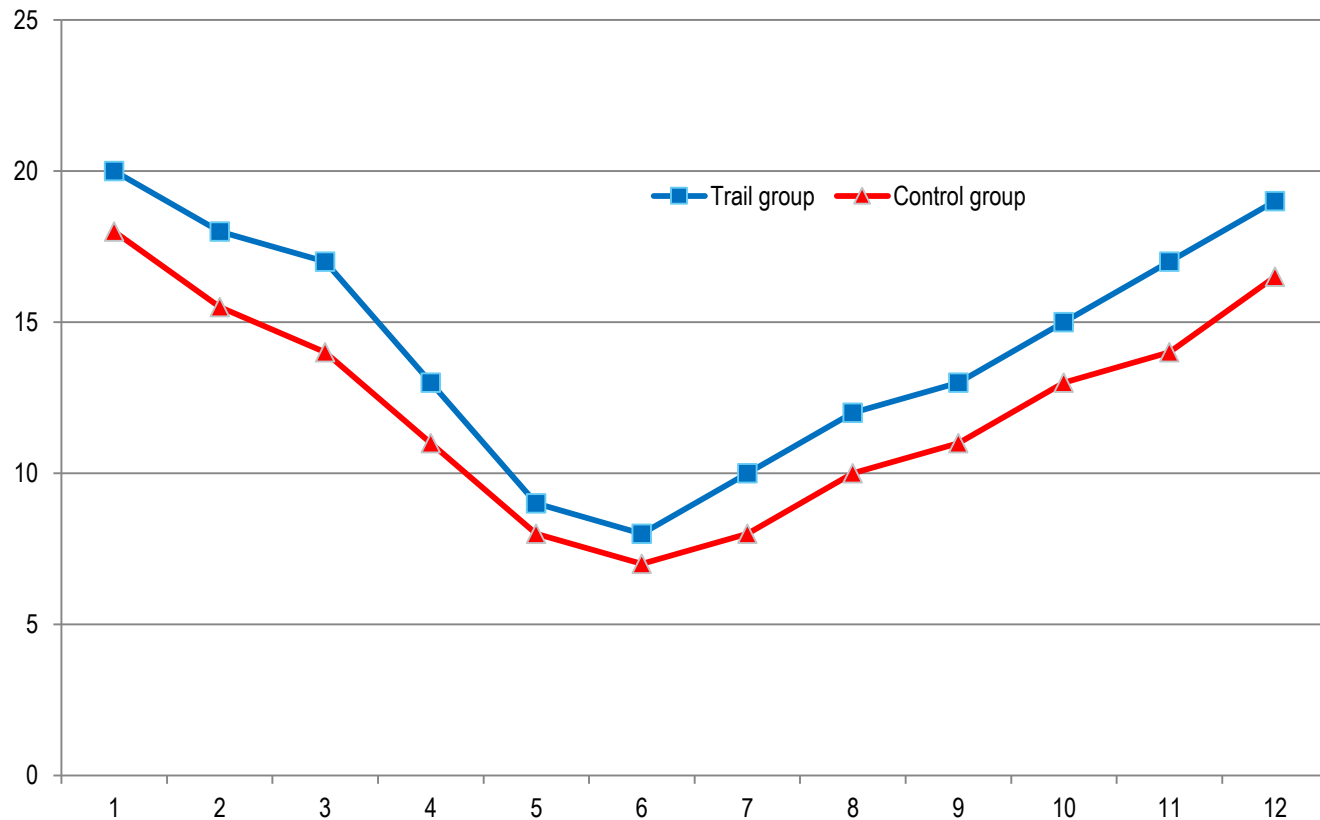
1. Body temperature
2. Milk production
3. Fertility
4. FAT
5. Protein



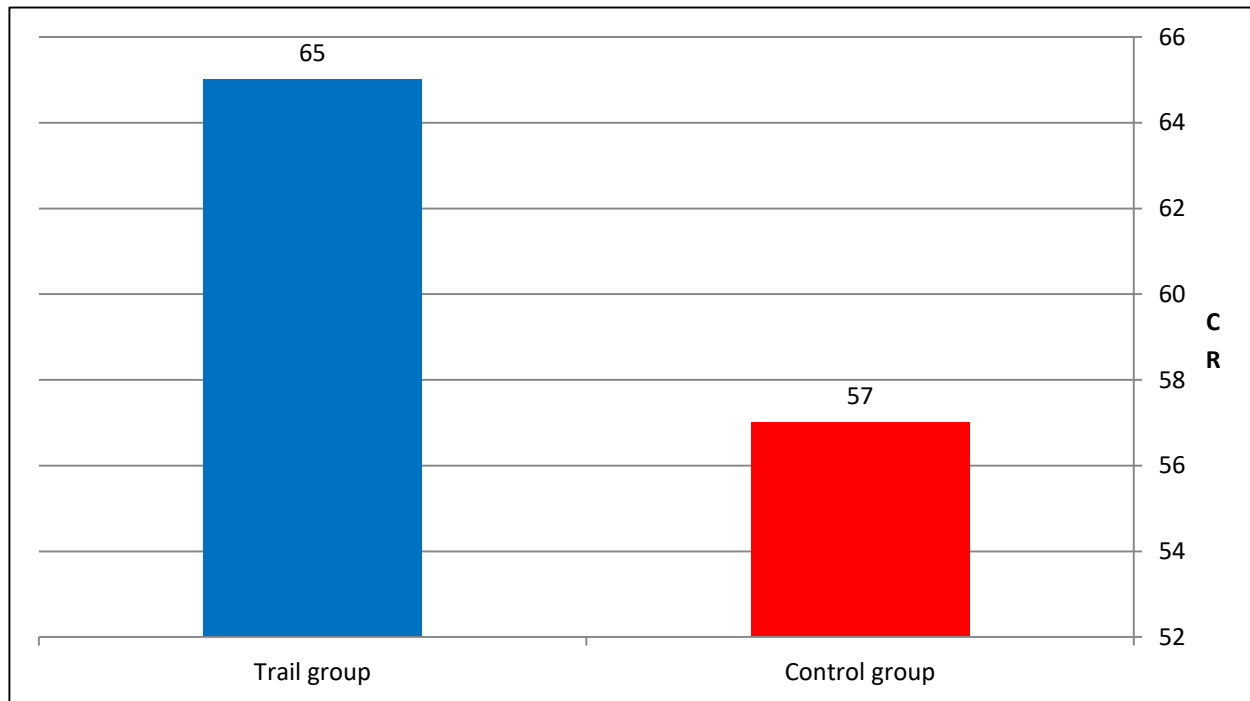
Cows body temperature



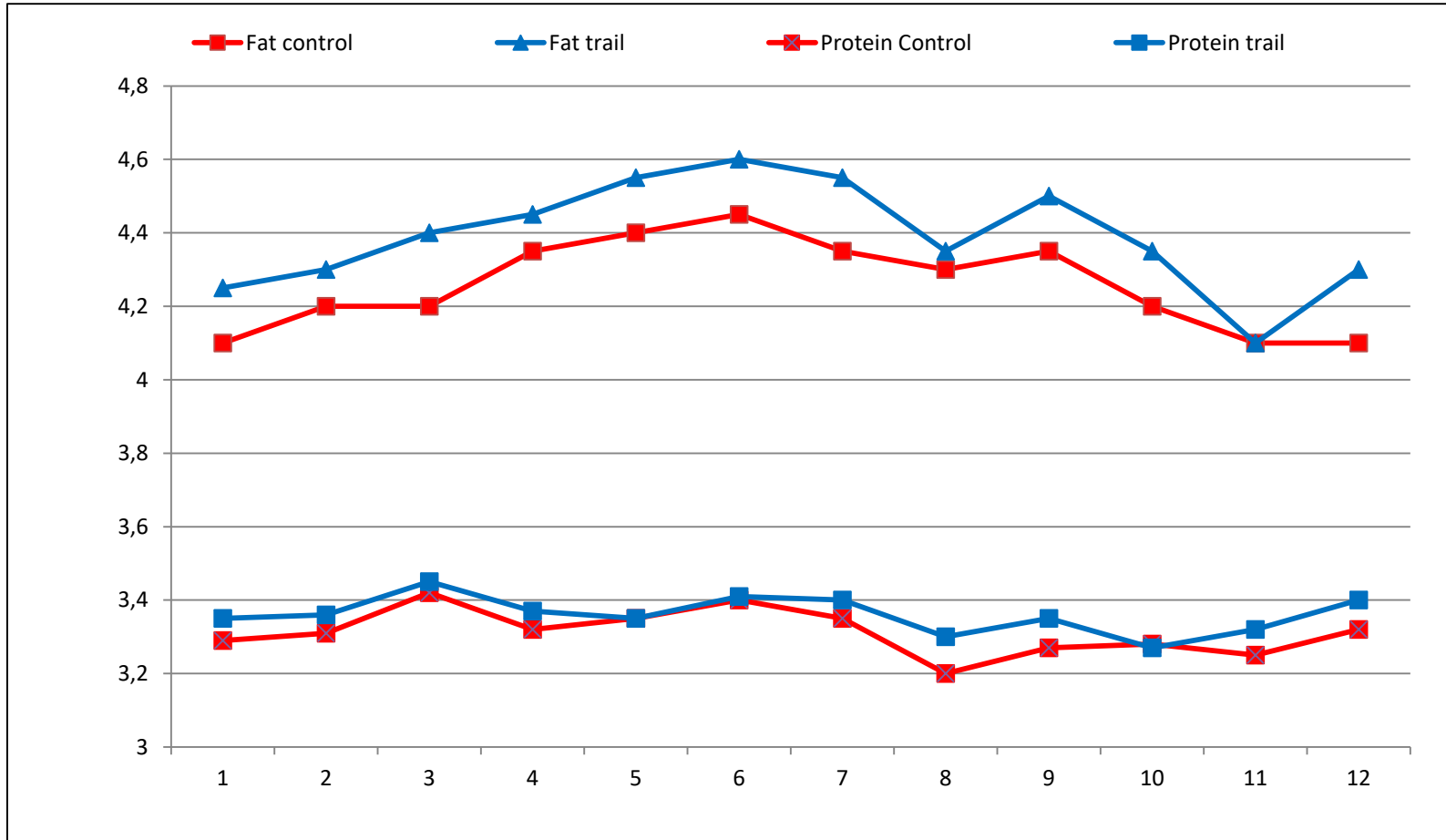
Milk production



Fertility



Protein & Fat



Financial summery trial 2

- Total investment for 400 cows = 30,000 USD.
- Expenses = 50 USD
- Extra profit from milk = $600\text{lit} \times 0.28\text{USD} = 168 \text{ USD}$
- Extra profit from fertility = $10\text{day} \times 3\text{USD} = 30$
- Extra profit from fat and protein = $5000 \text{ lit} \times 0.01 \text{ USD} = 50\text{USD}$
- Total profit = 198 USD per cow and 79,200 per 400 cows
- Pay back = 6 months to 1 year

Climate control

- In today modern dairy, climate is one of the biggest challenges
- Heat stress is still one of the key factors damaging professional and financial results
- **THI (Temperature Humidity Index).** Heat stress is a combination of Temp and humidity.
- Cows eat ~20kg dry meter per day
- Cow's digestion process generates heat.
- Cow sweat less, therefore, she struggles to get rid of this heat.

Temperature Humidity Index (THI)									
Relative Humidity %									
C	20	30	40	50	60	70	80	90	100
22	66	66	67	68	69	69	70	71	72
24	68	69	70	70	71	72	73	74	75
26	70	71	72	73	74	75	77	78	79
28	72	73	74	76	77	78	80	81	82
30	74	75	77	78	80	81	83	84	86
32	76	77	79	81	83	84	86	88	90
34	78	80	82	84	85	87	89	91	93
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No heat stress

Moderate heat stress

Severe heat stress

Dead cows

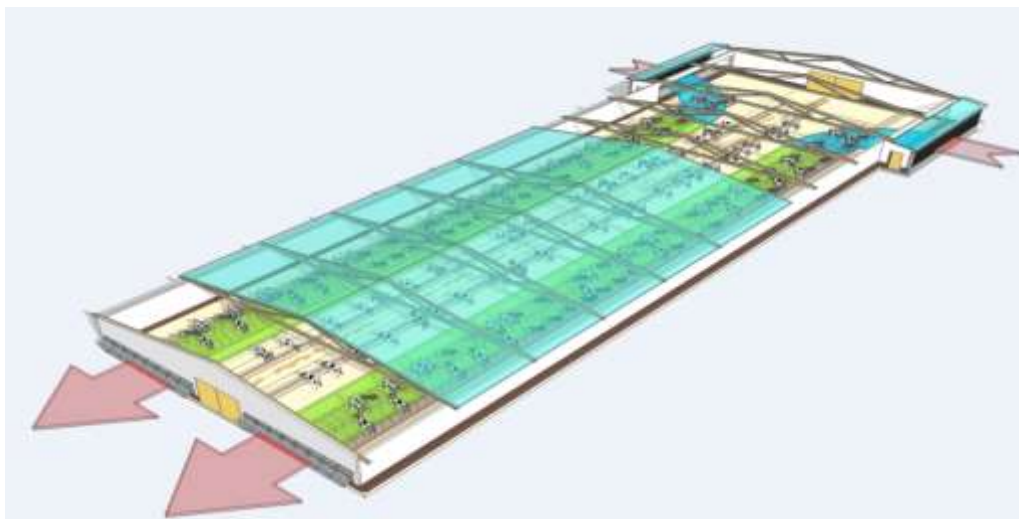
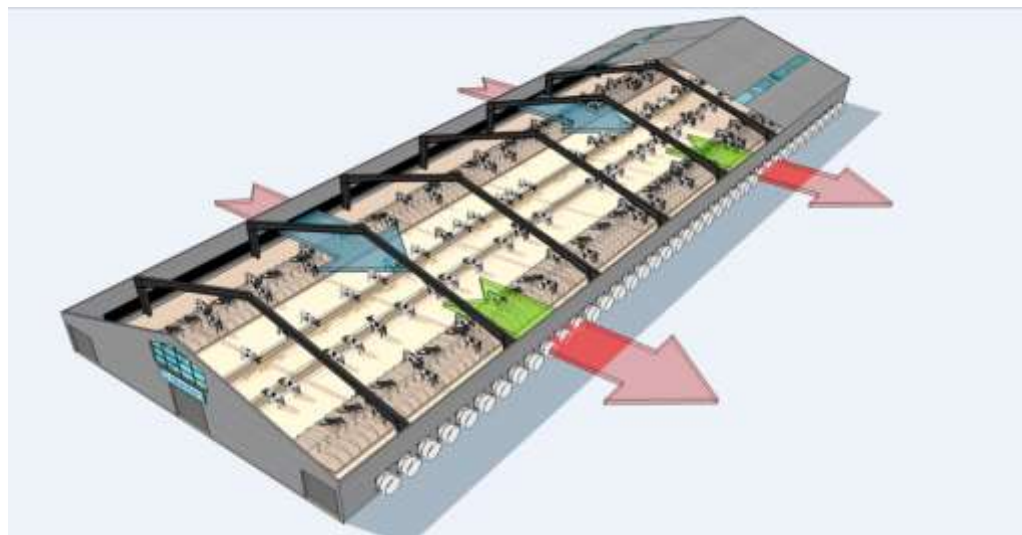
Cross / Tunnel ventilation

- Munters is one of the few companies with this climate control option.
- Very effective in hot and cold climate countries.
- Works perfect in free stall shed
- With or without cooling pads
- Less waste water to treat and stable airflow all over the shed
- Air exchange rate easily controlled
- Recommended air velocity of 500 – 700 fpm or 2.5 – 3.5 m/s
- Very good at cold climate too, gives the option to isolate the building and keep temperature.
- Requires totally closed barn
- Ensures air movement over cow body



Cross / Tunnel ventilation

- In both, tunnel and cross ventilation house, air velocity move from one side to the other side by negative pressure from the exhaust fans.



Cross / Tunnel ventilation product

EUROEMME® EM52



- Family member of the time proven Euroemme® fan range
- Fan built with outstanding strength for assuring high airflow at static pressure of up to 100 Pa.
- Fan housing and Venturi made of strong Munters Protect coated sheet-steel
- Redesigned 52" propeller suited for high static pressure environments
- Shutters are made of pressed Munters Protect coated steel in order to ensure highest strength
- Patented centrifugal system permits an energy efficient solution

COUNTRY OF ORIGIN	UNIT	DESCRIPTION	CAN BE USED IN:
Italy	Unit	Exhaust fan with Munters Protect	EMEA, Asia, Central and South America
PERFORMANCES			
Motor		2Hp	
Airflow at 0 Pa	m³/h [cfm]	43,000 [25,300]	
Airflow at 50 Pa	m³/h [cfm]	33,900 [19,900]	
Airflow at 75 Pa	m³/h [cfm]	27,600 [16,200]	
Airflow at 100 Pa	m³/h [cfm]	19,200 [11,300]	
Specific performance at 0 Pa	m³/h/W [cfm/W]	26.4 [15.5]	
<small>* All values refer to 3 phases 50Hz single speed motors. Note: airflow data are measured at standard conditions (20°C, 1,013hPa)</small>			

EM 50"

EUROEMME® EM50



- Family member of the time proven Euroemme® fan range
- Propeller is statically and dynamically balanced
- Patented centrifugal system permits an energy efficient solution
- Powerful springs keep shutters firmly closed when fan is not operating
- Every fan is individually checked for quality
- Fan housing and Venturi made of strong Munters Protect coated sheet-steel
- Shutters are made of pressed Munters Protect coated steel in order to ensure highest strength
- Central hub and v-belt pulley are made from die-cast aluminium, with reinforced ribs for prolonged lifetime

COUNTRY OF ORIGIN	UNIT	DESCRIPTION	CAN BE USED IN:
Italy	Unit	Exhaust fan with Munters Protect	EMEA, Asia, Central and South America
PERFORMANCES			
Motor		1.0/1.2Hp	1.5Hp
Airflow at 0 Pa	m ³ /h [cfm]	37,000 [21,800]	42,400 [25,000]
Airflow at 25 Pa	m ³ /h [cfm]	32,500 [19,200]	38,400 [22,600]
Airflow at 50 Pa	m ³ /h [cfm]	26,200 [15,400]	33,800 [19,900]
Specific performance at 0 Pa	m ³ /h/W [cfm/W]	33.9 [20.0]	27.0 [15.9]

* All values refer to 3 phases 50Hz single speed motors.
Note: airflow data are measured at standard conditions (20°C, 1,013hPa)

EC 52"

EUROEMME® EC52 WITH MUNTERS DRIVE



- Patented EC motor for excellent energy reduction over standard AC motors
- Maintenance free: no belts to tension or replace
- Soft start for eliminating energy spikes
- Variable speed for providing a wide range of air flow with excellent efficiency values
- Strong and efficient steel propeller, discharge cone for best achievements in performances and strength
- Shutter operated by gear motor: opening not linked to air flow or propeller spin
- Ideal fan for minimum ventilation applications

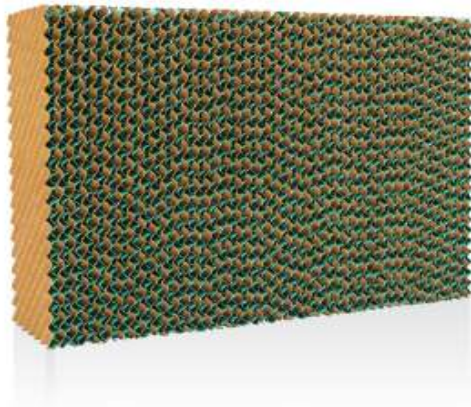


COUNTRY OF ORIGIN	UNIT	DESCRIPTION		CAN BE USED IN:
Italy	Unit	Exhaust fan with Munters Protect		EMEA, Asia, Central and South America
PERFORMANCES				
Motor		260 rpm	370 rpm	495 rpm
Airflow at 0 Pa	m³/h [cfm]	28,500 [16,800]	40,700 [24,000]	53,200 [31,300]
Airflow at 12 Pa	m³/h [cfm]	24,300 [14,300]	37,700 [22,200]	51,400 [30,200]
Airflow at 25 Pa	m³/h [cfm]	15,200 [8,900]	34,600 [20,400]	49,400 [29,100]
Specific performance at 12 Pa	m³/h/W [cfm/W]	81.2 [47.8]	49.9 [29.4]	30.6 [18.0]
Specific performance at 25 Pa	m³/h/W [cfm/W]	48.0 [28.3]	43.8 [25.8]	28.4 [16.7]

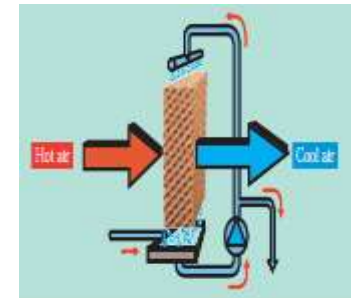
* All values refer to 3 phases 50Hz single speed motors.
Note: airflow data are measured at standard conditions (20°C, 1,013hPa)

Climate control – cooling pads

CELdek® 7060-15



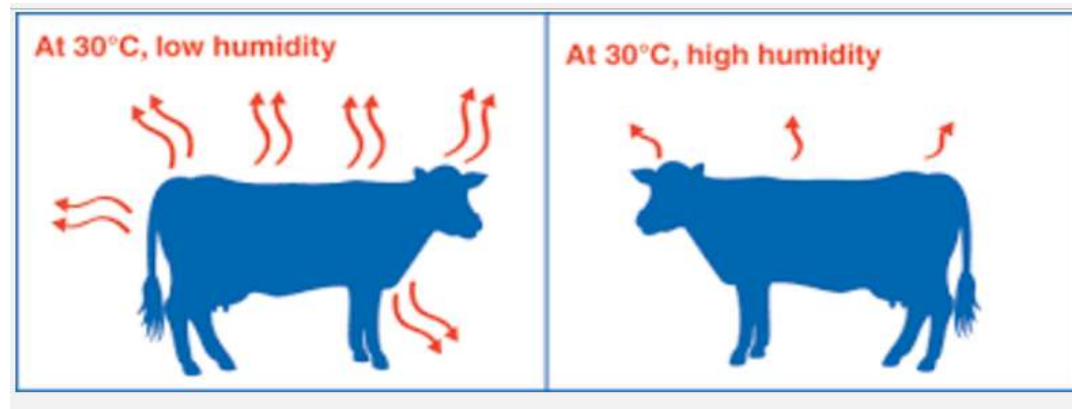
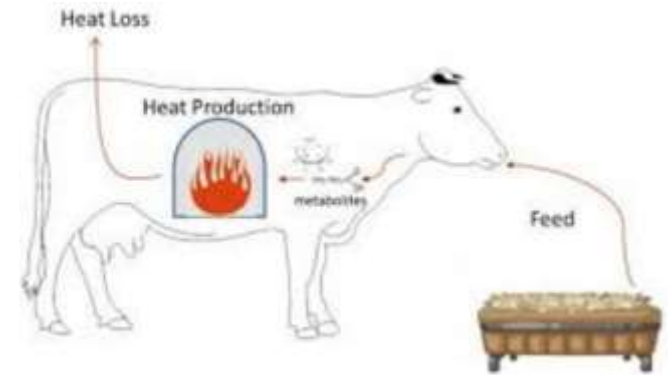
- High evaporation efficiency and superb wetting properties
- Low pressure drop when wet, leading to lower operating costs
- No water carry-over
- Low scaling and self cleaning
- Strong and self supporting
- Long life time and low running costs
- Quick and easy to install
- Environmentally friendly
- Consistent high quality



COUNTRY OF ORIGIN	UNIT	DESCRIPTION	CAN BE USED IN:
China, Italy, USA, Mexico, Brazil	m ²	Cooling pad	Globally
STANDARD DIMENSIONS			
Height (max.)	m	2	
Width	m	0.6	
Depth	m	0.15	

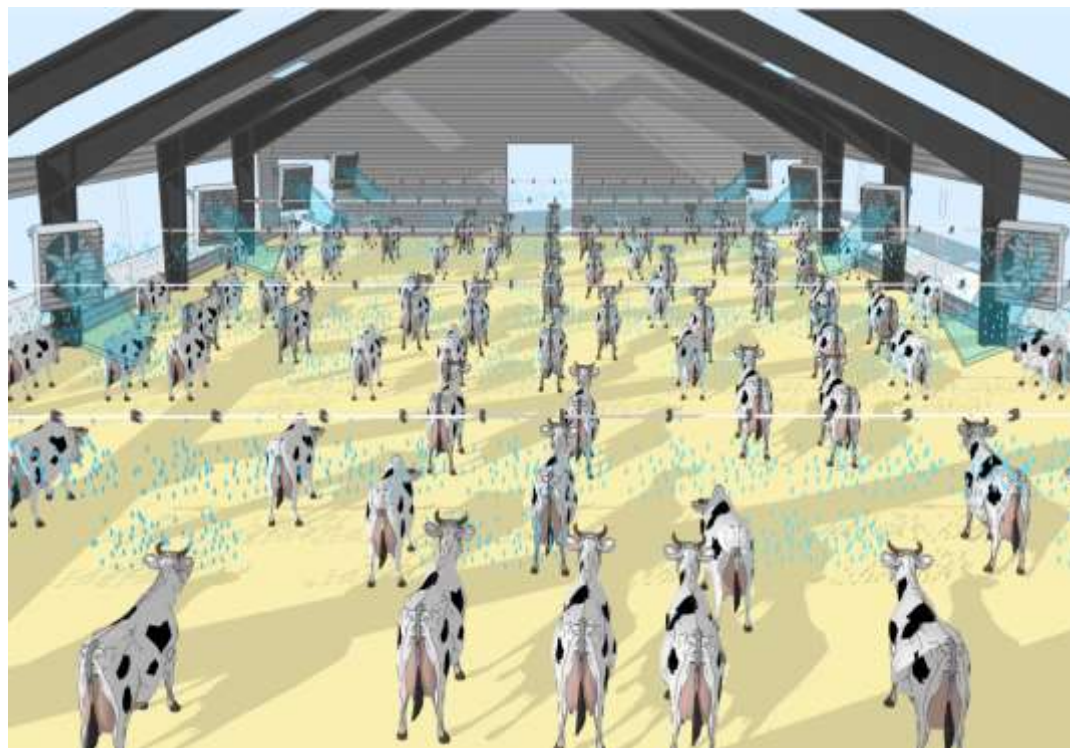
Climate control - Direct cooling

- Direct cooling concept works based on evaporating water from the cow's body.
- In high THI farm, cow should spend 9h a day in cooling process.
- This concept is successfully used on many dairy farms around the world .
- Direct cooling saves energy by cooling the cow only.
- The cooling process takes place in 3 different areas:
 - Waiting area before milking parlour
 - Feeding lane
 - Resting area
- In very high THI countries, Direct cooling can also be used in cow traffic lane.



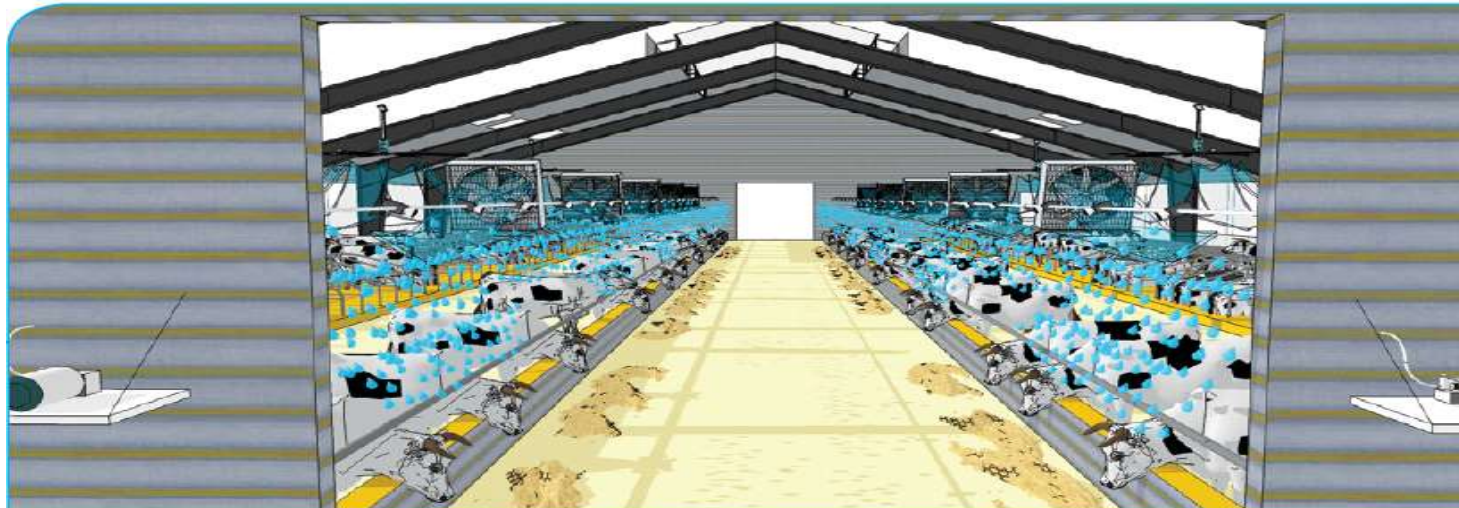
Direct cooling - waiting area

- Low pressure sprinklers with high capacity 200 -500 lit/h
- High capacity fans
- Intervals of: 30 sec of water
4 min of air
- Cycle of 45min per group of cows
- Cows visit this area 2 – 3 times/day
- Waiting area can be used also between milking shifts to cool cows.



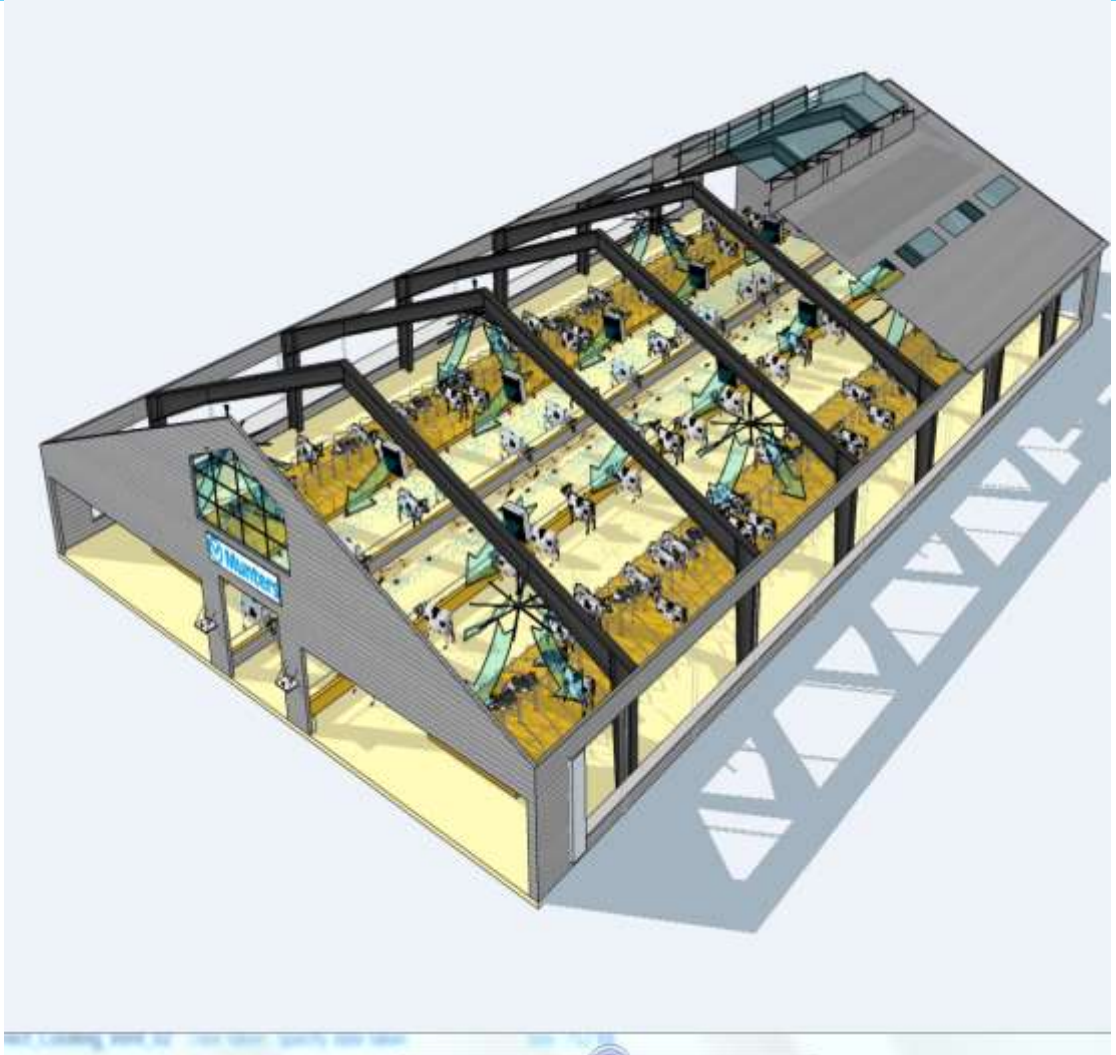
Direct cooling feeding lane

- Cows spend many hours in feeding lane, therefore, it is attractive place to use cooling system
- A 4 min air and 1 min water cycle for 45 min should be applied
- Low pressure sprinklers, low capacity of 70 – 80 lit/h should be used
- Medium-sized fans with high velocity as MFS 36 or EDC 24 inch
- Fans to be installed about 2.5 metres above the ground
- 4 m/s air velocity is needed
- Water sprinklers position to ensure full cover of water (every 2.5 metres)



Climate control – resting area

- A new study shows: higher milk production of 3ℓ per cow under breeze fans at resting area compared to cows without breeze fan
- In resting area: while cooling down the cows the fans also dry the bedding, letting the cows rest in a comfortable place.



Direct cooling - product

EUROEMME® MFS52



- Family member of the time proven Euroemme® fan range
- Large cooling footprint
- Statically and dynamically balanced propeller
- Cast aluminium propeller hub for the best bearing protection
- Belt driven propeller resulting in low noise levels
- Horizontal support bar reduces stress on fan housing when mounted overhead
- Motor positioned in air stream for maximum cooling
- Mounting kits for ease of mounting
- Optional belt tensioner

COUNTRY OF ORIGIN	UNIT	DESCRIPTION	CAN BE USED IN:
Italy	Unit	Air blower	EMEA, Asia, Central and South America
PERFORMANCES			
Motor		1.0/1.2Hp	2.0Hp
Airflow at 0 Pa	m ³ /h [cfm]	37,638 [22,153]	44,803 [26,370]
Specific performance at 0 Pa	m ³ /h/W [cfm/W]	33.5 [19.7]	25.3 [14.9]

* All values refer to 3 phases 50Hz single speed motors.
Note: airflow data are measured at standard conditions (20 °C, 1,013hPa)

Direct cooling product

EUROEMME® MFS36



- Family member of the time proven Euroemme® fan range
- Large cooling footprint
- Statically and dynamically balanced propeller
- Cast aluminium propeller hub for the best bearing protection
- Belt driven propeller resulting in low noise levels
- Horizontal support bar reduces stress on fan housing when mounted overhead
- Motor positioned in air stream for maximum cooling
- Mounting kits for ease of mounting
- Optional belt tensioner

COUNTRY OF ORIGIN	UNIT	DESCRIPTION	CAN BE USED IN:	
Italy	Unit	Air blower	EMEA, Asia, Central and South America	
PERFORMANCES				
Motor		0.5Hp	0.75Hp	1.0/1.2Hp
Airflow at 0 Pa	m³/h [cfm]	16,740 [9,853]	19,770 [11,636]	21,973 [12,933]
Specific performance at 0 Pa	m³/h/W [cfm/W]	33.3 [19.6]	26.7 [15.7]	21.6 [12.7]

* All values refer to 3 phases 50Hz single speed motors.
Note: airflow data are measured at standard conditions (20°C, 1.013hPa)

Direct cooling – product

HADAR 7110*



- Modular construction for simple use and modification
- Wide range of wetted patterns with 9 different inserts
- 11 color-coded nozzles with flow rates from 23-333 l/h
- Excellent water distribution
- Leakage Prevention Device (LPD)
- Recommended working pressure: 1.5-3.0 bar
- Wetted diameter: 1.7-11.0 m

COUNTRY OF ORIGIN		UNIT		DESCRIPTION			CAN BE USED IN:	
Israel		Unit		For feed lane			Globally	
PERFORMANCES								
Used	Pressure	Nozzle size (mm)	Nozzle color	Flow rate	Mist sprayer (m)	Small sprayer (m)	Half Circle sprayer (180°)	LPD
Feeding lane	2 bar	1,2	Oreng	75	2,6	2,8	2,8	V
Milking parlor waiting area	2 bar	2,3	Brown	265	5,4	3,2	3,7	V

* Product manufactured by Nandolan.

* Product manufactured by Nandao.

Direct cooling product

WDP MIST



- Alternative to evaporative pad cooling in cold continental and moderate climates, typically characterized by very brief periods of hot weather
- Minimizes heat stress which improves feed conversion for increase production
- Optimal relative humidity in-farm throughout the year
- Environmental benefits by effectively suppressing dust particles from the airstream
- Fast cleaning operation through preparatory soaking of various in-farm equipment
- Corrosion resistant components, made in stainless steel
- Quick and easy installation
- Fits on any size of housing system

COUNTRY OF ORIGIN	UNIT	DESCRIPTION		CAN BE USED IN:	
Denmark	Unit	High pressure fogging & cooling system		EMEA, Asia	
PERFORMANCES					
Maximum working pressure	Bar [PSI]	70 [1015]			
Water flow	l/min [gal/h]	12.0 [190.2]		21.0 [332.9]	
Nozzle tip diameter	mm	0.2	0.3	0.2	0.3
Maximum nozzles/pump	pcs	180	110	314	193
Nozzle water flow at 70Bar	l/h [gal/h]	4.0 [1.06]	6.5 [1.72]	4.0 [1.06]	6.5 [1.72]

Direct cooling product

BREEZE FAN & TEMPMAN



- 8 blade High Volume Low Speed fan (HVLS)
- Variable speed control
- Extremely energy efficient
- Very high $\text{m}^3/\text{h}/\text{W}$ (high cfm per watt)
- Very low noise level
- Reduces heat stress and improves comfort
- Promotes healthier air quality, reduces bacteria and ammonia
- Easy to install, in new or existing structures
- Available with EC motor

COUNTRY OF ORIGIN	UNIT	DESCRIPTION	CAN BE USED IN:
Denmark	Unit	Solid HVLS fan	Globally
PERFORMANCES			
Speed control		Min. speed (20%)	Max. speed (100%)
Airflow at 0 Pa	m^3/h [cfm]	63,000 [37,000]	183,000 [108,000]
Specific performance at 0 Pa	$\text{m}^3/\text{h}/\text{W}$ [cfm/W]	420 [247]	141 [83]

Note: airflow data are measured at standard conditions (20°C, 1,013hPa)

Climate control - summery

- Munters sells application, not equipment.
- Munters helps the farmer find the most suitable solution for his farm.
- Munters supports the farm in designing the climate control system
- With years of experience, Munters achieves best results in all climate control aspects.

Thank you

