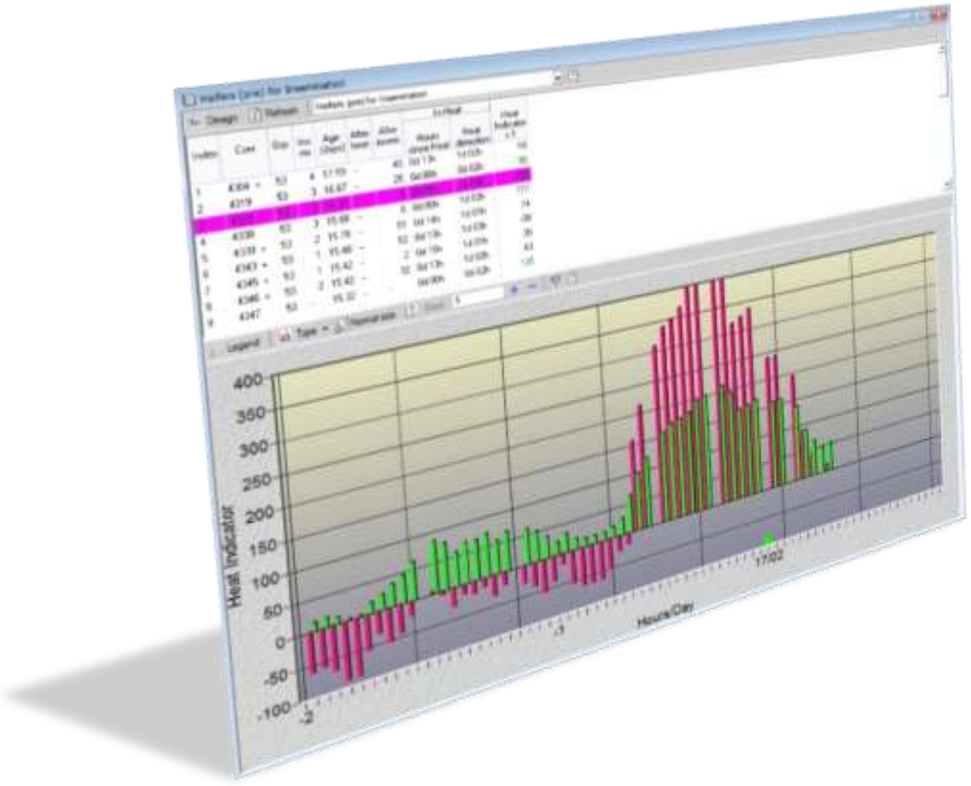
Digitalizacija u primarnoj proizvodnji mlijeka

Daniel Stojsavljević

DIGITALIZACIJA

- pretvorba teksta, slike, zvuka, pokretnih slika ili trodimenzijalnog oblika nekog objekta u digitalni oblik.

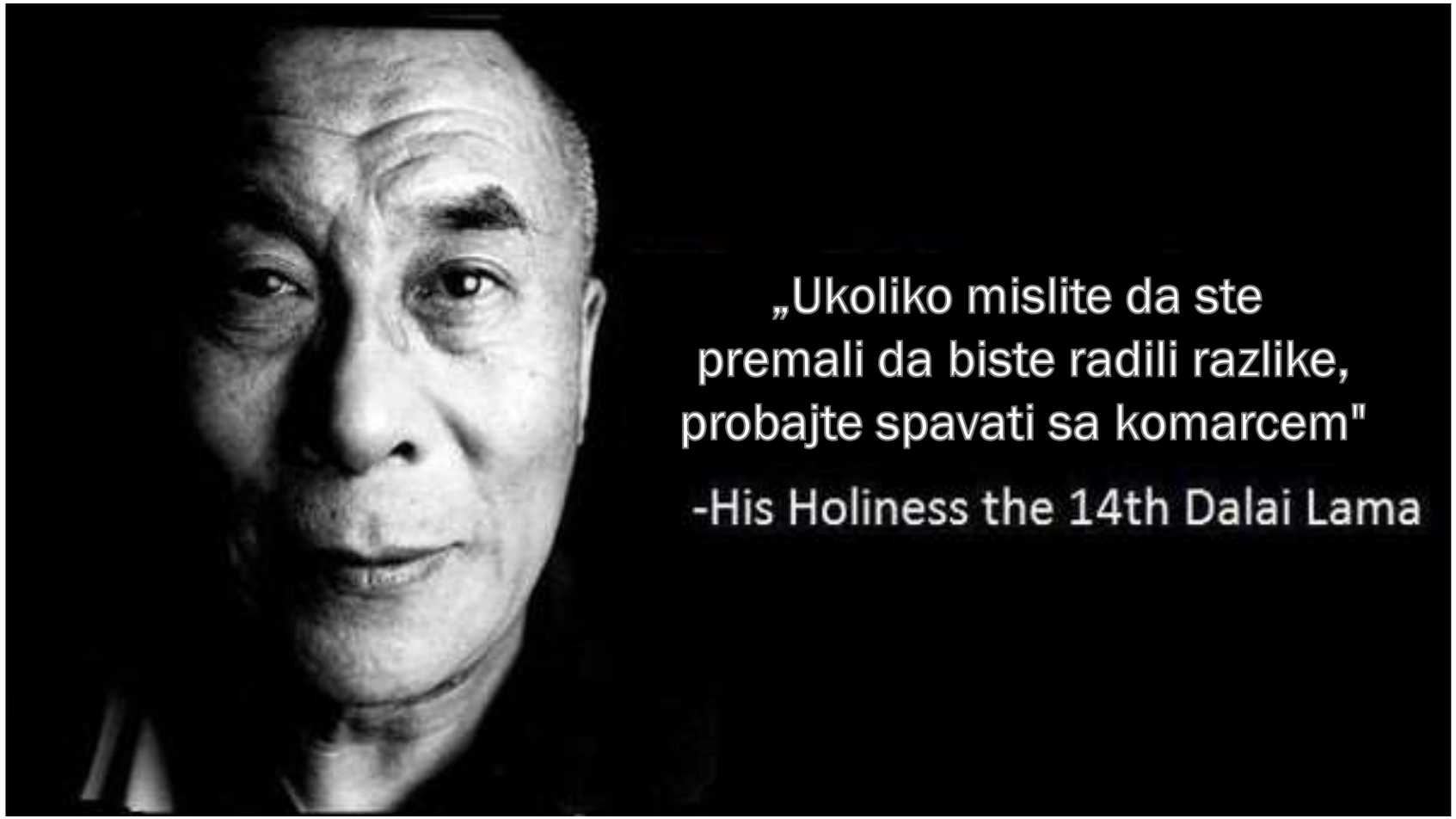


Index	Cow	Grp.	Ins. no.	Age (days)	After heat	After insem.	In Heat		Heat Indicator s.1
							Hours since Heat	Heat detection	
1	4304 +	53	4	17.59	--	40	0d 13h	1d 02h	-18
2	4319	53	3	16.67	--	25	0d 00h	0d 02h	90
3	4329 +	53	3	16.37	--	0	0d 05h	1d 03h	239
4	4338	53	3	15.88	--	0	0d 00h	1d 03h	777
5	4339 +	53	2	15.78	--	51	0d 14h	1d 01h	74
6	4343 +	53	1	15.48	--	52	0d 13h	1d 03h	-38
7	4345 +	53	1	15.42	--	2	0d 15h	1d 01h	35
8	4346 +	53	2	15.42	--	32	0d 13h	1d 02h	43
9	4347	53	--	15.32	--	--	0d 00h	0d 02h	125
10	4350 +	53	--	15.19	--	--	0d 12h	1d 01h	31
11	4354 +	53	--	14.92	--	--	0d 11h	1d 02h	55

DNA STRUČNJAKA ZA KRAVE

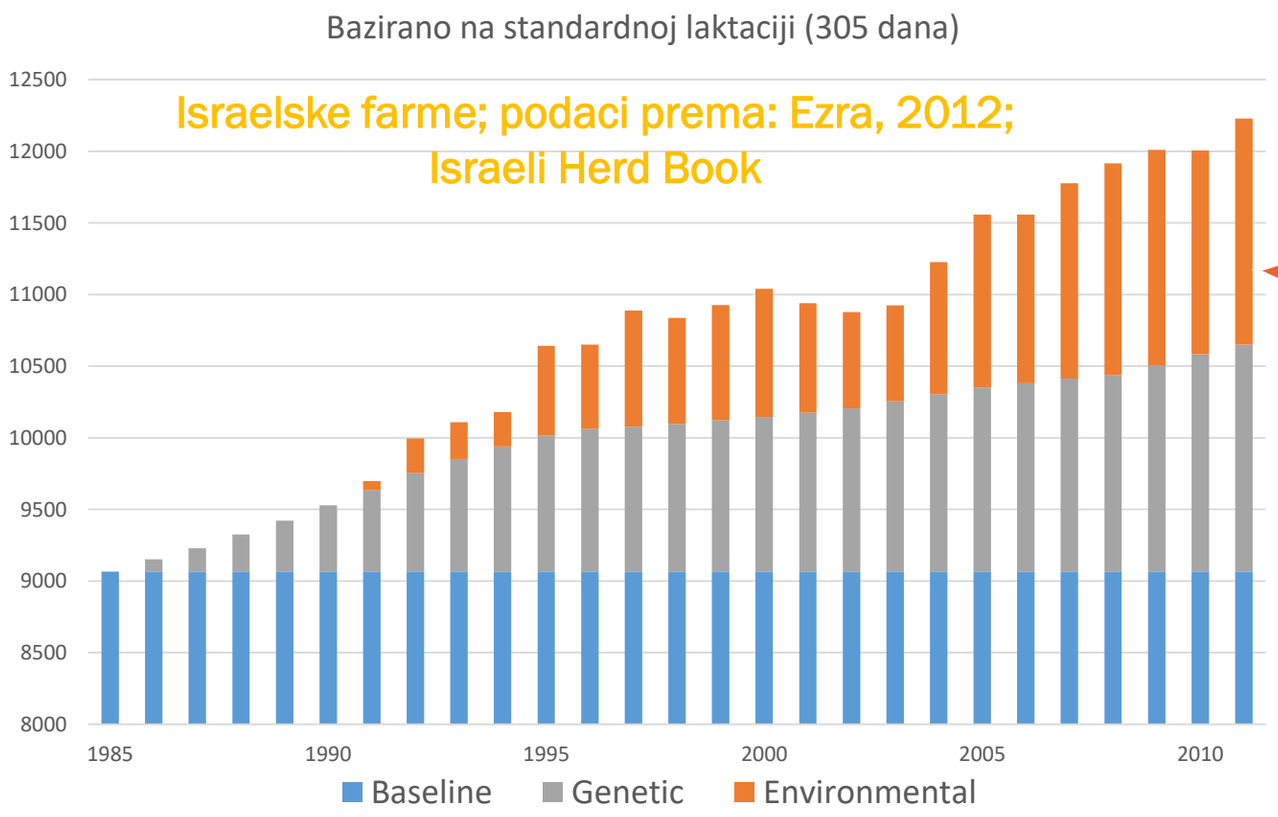
"Svaka je krava drugačija. Pojedinačne odluke najviše donose, ali ja upravljam s 500 krava, podijeljenih u 8 grupa... Pojedinačni nadzor je nemoguć."

Da li je moguće učiniti *veliki pomak* upravljanjem farmom muznih krava?


„Ukoliko mislite da ste
premali da biste radili razlike,
probajte spavati sa komarcem"
-His Holiness the 14th Dalai Lama

PITANJE VJEROVANJA?

O KOJOJ SE ZEMLJI RADI?



3,200 kg napredak

50% pripisano okolišnim uvjetima

Israel, farme muznih krava:

Povećano usvajanje Afimilk menadžment koncepta s 10% na 80%

Unapređenje mendžmenta

- Naprednim sv rešenjima
- Poboljšanjem praćenja reprodukcije
- Nadogradnjom izmuzišta
- Robotima za mužu

MENADŽMENT

Zašto trošiti sav taj novac za poboljšavanje genetike Vašeg stada ako ćete te krave tretirati na isti način, kao i do sada?

FARMA MUZNIH KRAVA

Gdje nam sve curi

- Planiranje stada
- Dobrobit
- Plodnost
- Rad
- Ishrana
- Zdravlje

RJEŠENJA ZA PROFITABILNU PROIZVODNJU MLIJEKA

Rješenja za automatizaciju i menadžment farme

Što farmer dobiva

Važne informacije o svakoj kapi mlijeka

Kakvo je stanje mojih krava?

- ✓ Proizvodnja mlijeka
- ✓ Sastav mlijeka

Kako rade moji radnici?

- ✓ Rutina u izmuzištu
- ✓ Učinkovitost mužnje

Softver za menadžment: Razumijevanje i djelovanje

Menadžment stada

Upravljanje životinjama i donošenje odluka

Analiza

Algoritmi pretvaraju senzorske podatke u upotrebljive podatke

Automatizacija

Sustav radi za Vas

Rješenja za automatizaciju i menadžment farme

Što farmer dobiva

Zdravlje

Dobrobit

Plodnost

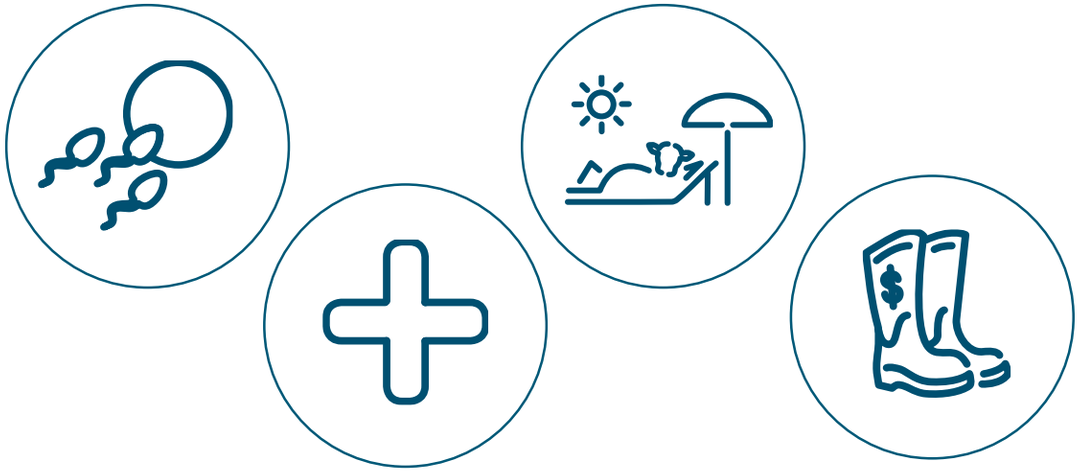
Ušteda rada

Ekonomija farme

Samostalna rješenja
za nadzor krava

Što farmer dobiva

- Menadžment plodnosti – **više gravidnih krava**
- Menadžment zdravlja – **manje bolesnih krava**
- Menadžment dobrobiti – **komfor za krave**
- Menadžment rada – **smanjeni troškovi rada**



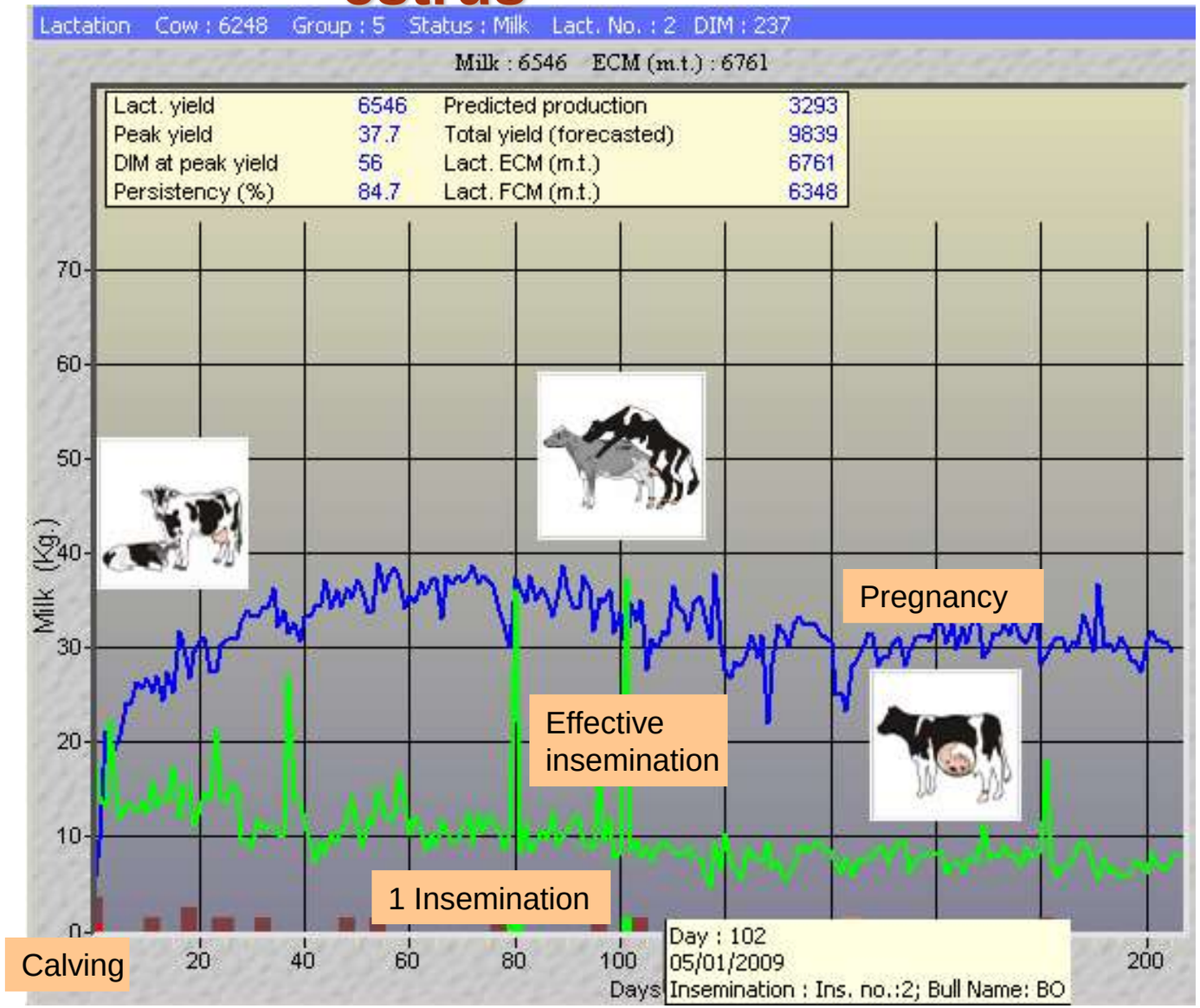
Afimilk Silent Herdsman

AfiAct II

Jedinstvene prednosti:

- Najbolja detekcija estrusa i nadzor zdravlja u branši
- Jednostavno za korisnika, na računalu i na mobilnim uređajima
- Integrirano s Afimilkovim sustavom za menadžment

Efikasnost otkrivanja krava u estrusu putem "Afi izvještaja za estrus"



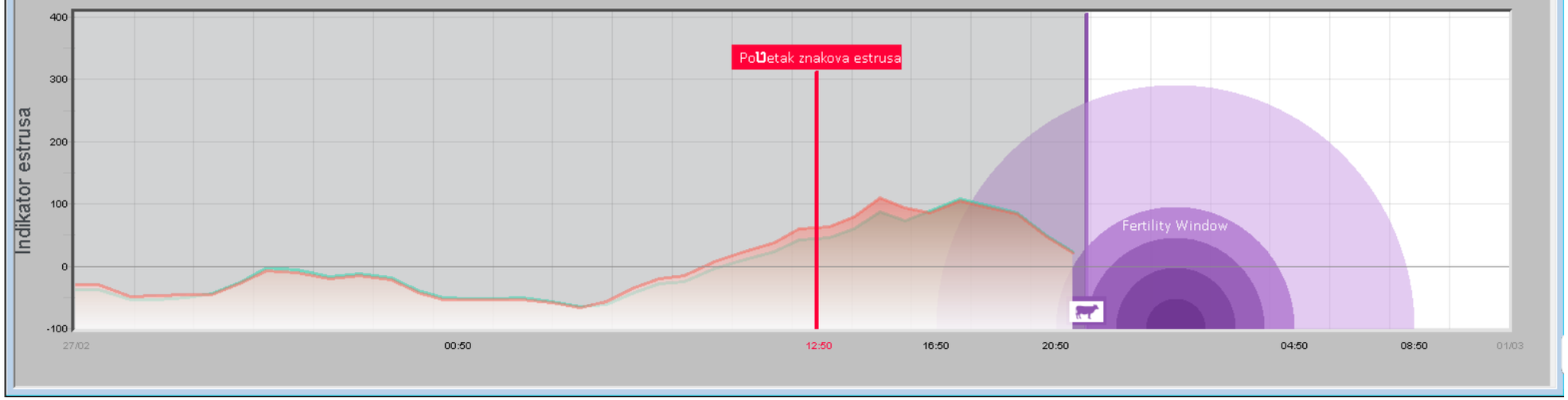
OPTIMALNO VRIJEME ZA OSJEMENJIVANJE

izvetaj za ivotinje za osemenjavanje (Poslednje auriranje: 28/02/2019 21:52:44)

Koncepcija | auriraj | izvetaj za ivotinje za osemenjavanje | Prozor za grafikon plodnosti

Indeks	Krava	Status	Gru.	Gin. status	Broj		starost (meseci)	DUM	Dani posle		Znakovi estrusa		Fertility Window		Indikator estrusa		Dani posle	
					Lakt.	osem.			Estrus	osem.	Pokrenuto	Zavreno	Fertility Window	Koncepcija	1	2	Promeniti grupu	Odravanje kopita
1	2018	mleko	1	Inseminacija	1	1	26,56	51	0	0	0d 09h	0d 02h	20:50 - 04:50	Visoka SK	111	106	--	--
2	6662	mleko	1	Inseminacija	1	1	24,03	57	0	0	0d 17h	--	13:04 - 21:04	Umerena SK	357	192	--	--
3	7189	mleko	1	Inseminacija	2	2	39,94	76	0	0	0d 14h	--	15:47 - 23:47	Visoka SK	246	172	--	--
4	7465	mleko	1	Inseminacija	3	1	50,43	87	36	36	0d 08h	0d 06h	22:11 - 06:11	Umerena SK	76	42	--	--

Legenda



Design | Refresh | Fertility Report (General)

	Heifers (pre)	Heifers (pre) %	1st lact.	1st lact. %	2+ lact.	2+ lact. %	All cows	All cows %	Total	Total %
Not inseminated	2	1.07	2	1.21	7	1.81	9	1.63	11	1.49
Not inseminated by decision	--	--	--	--	--	--	--	--	--	--
Distribution of first inseminations										
Insem. (< 50 DIM)			5	3.05	19	4.91	24	4.36		
C.R. (< 50 DIM)				40.00		52.63		50.00		
Insem. (50 - 70 DIM)			8	4.88	54	13.95	62	11.25		
C.R. (50 - 70 DIM)				75.00		53.70		56.45		
Insem. (70 - 90 DIM)			43	26.22	193	49.87	236	42.83		
C.R. (70 - 90 DIM)				58.14		60.62		60.17		
Insem. (90 - 110 DIM)			92	56.10	113	29.20	205	37.21		
C.R. (90 - 110 DIM)				71.74		69.91		70.73		
Insem. (110 - 130 DIM)			14	8.54	6	1.55	20	3.63		
C.R. (110 - 130 DIM)				71.43		66.67		70.00		
Insem. (130 - 150 DIM)			2	1.22	--	--	2	0.36		
C.R. (130 - 150 DIM)				50.00		--		50.00		
Insem. (=> 150 DIM)			--	--	2	0.52	2	0.36		
C.R. (=> 150 DIM)				--		--		--		
Insem. (age < 12 months)	--	--								
C.R. (age < 12 months)		--								
Insem. (age 12 - 14 months)	26	14.21								
C.R. (age 12 - 14 months)		92.31								
Insem. (age 14 - 16 months)	157	85.79								
C.R. (age 14 - 16 months)		91.52								
Insem. (age 16 - 18 months)	--	--								
C.R. (age 16 - 18 months)		--								
Insem. (age => 18 months)	--	--								
C.R. (age => 18 months)		--								
Normal insem. and conception rates										
First inseminations C.R.	183	83.06	164	67.07	387	61.76	551	63.34	734	68.26
Second inseminations C.R.	31	87.10	65	56.92	168	61.31	233	60.09	264	63.26
Third inseminations C.R.	7	71.43	28	57.14	69	59.42	97	58.76	104	59.62
Fourth + more inseminations C.R.	2	100.00	21	57.14	41	43.90	62	48.39	64	50.00
Total of inseminations C.R.	223	83.41	278	62.23	665	59.85	943	60.55	1166	64.92
Distribution of inseminations										
Normal inseminations	223	99.11	278	99.29	665	99.55	943	99.47	1166	99.40

Use Expensive Semen Here

Highest Conception Rates 90-110 DIM

Sexed Semen 80% on Heifers

1st Conception Rate 68%

Sano

Fertility Report (General) (2011/03/01 – 2012/02/29) ()

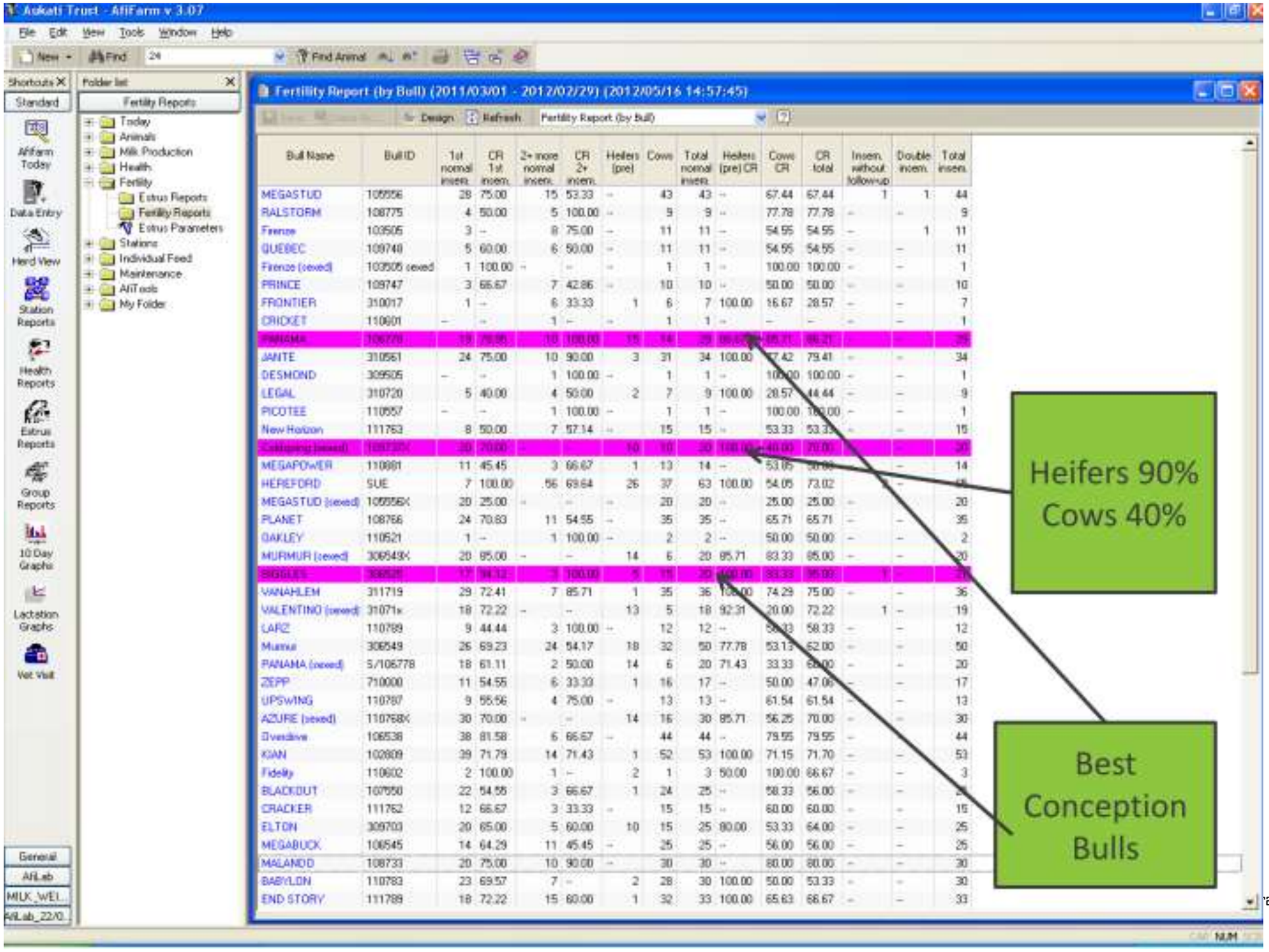
Design | Refresh | Fertility Report (General)

	Heifers (pre)	Heifers (pre) %	1st lact.	1st lact. %	2+ lact.	2+ lact %	All cows	All cows %	Total	Total %
Insem. (age 14 - 16 months)	157	85.79								
C.R. (age 14 - 16 months)		81.53								
Insem. (age 16 - 18 months)	–	–								
C.R. (age 16 - 18 months)		–								
Insem. (age => 18 months)	–	–								
C.R. (age => 18 months)		–								
Normal insem. and conception rates										
First inseminations C.R.	183	83.06	164	67.07	387	61.76	551	63.34	734	68.26
Second inseminations C.R.	31	87.10	65	56.92	168	61.31	233	60.09	264	63.26
Third inseminations C.R.	7	71.43	28	57.14	69	59.42	97	58.76	104	59.62
Fourth + more inseminations C.R.	2	100.00	21	57.14	41	43.90	62	48.39	64	50.00
Total of inseminations C.R.	223	83.41	278	62.23	665	59.85	943	60.55	1166	64.92
Distribution of inseminations										
Normal inseminations	223	99.11	278	99.29	665	99.55	943	99.47	1166	99.40
Inseminations without follow-up	2	0.89	2	0.71	3	0.45	5	0.53	7	0.60
Total inseminations	225		280		668		948		1173	
Double inseminations	–	–	–	–	2	0.30	2	0.21	2	0.17
Total inseminations (+double)	225		280		670		950		1175	
Heat Detection										
Distribution of cycles: 5-17 days	3	11.54	5	5.56	20	9.85	25	8.53	28	8.78
18-25 days	14	53.85	68	75.56	143	70.44	211	72.01	225	70.53
26-35 days	3	11.54	4	4.44	12	5.91	16	5.46	19	5.96
36-60 days	6	23.08	13	14.44	28	13.79	41	13.99	47	14.73
Average days between inseminations	26		23		24		24		24	
Rejections by inseminator	–		–		–		–		–	
Preg. checks with negative results	11	5.58	8	4.37	56	12.28	64	10.82	75	8.97
Sums and Averages										
Calving Interval					383		383			
Total of confirmed pregnancies	186	95.38	173	94.54	398	91.28	571	92.25	757	93.00
Avg. days open	15.31		128		123		124			
Avg. days to first service	14.56		91		82		85			
Avg. Wasted Days	23		36		42		40		36	
Open more then 150 DIM			9	5.45	16	4.15	25	4.54		
Avg. inseminations per cow	1.14		1.52		1.53		1.52		1.43	
Avg. inseminations per pregnancy	1.23		1.60		1.57		1.58		1.49	

Calving Interval 383 Days

Empty Rate 7%

1.49 Inseminations Per Pregnancy


Aokati Trust - AfiFarm v 3.07
Fertility Report (by Bull) (2011/03/01 - 2012/02/29) (2012/05/16 14:57:45)
Heifers 90%
Cows 40%
Best
Conception
Bulls

Sano

SK/OSJEMENITELJ

Fertility Report (by Inseminator) (08/02/2010 - 08/02/2011) (02/10/2011 12:54:56)

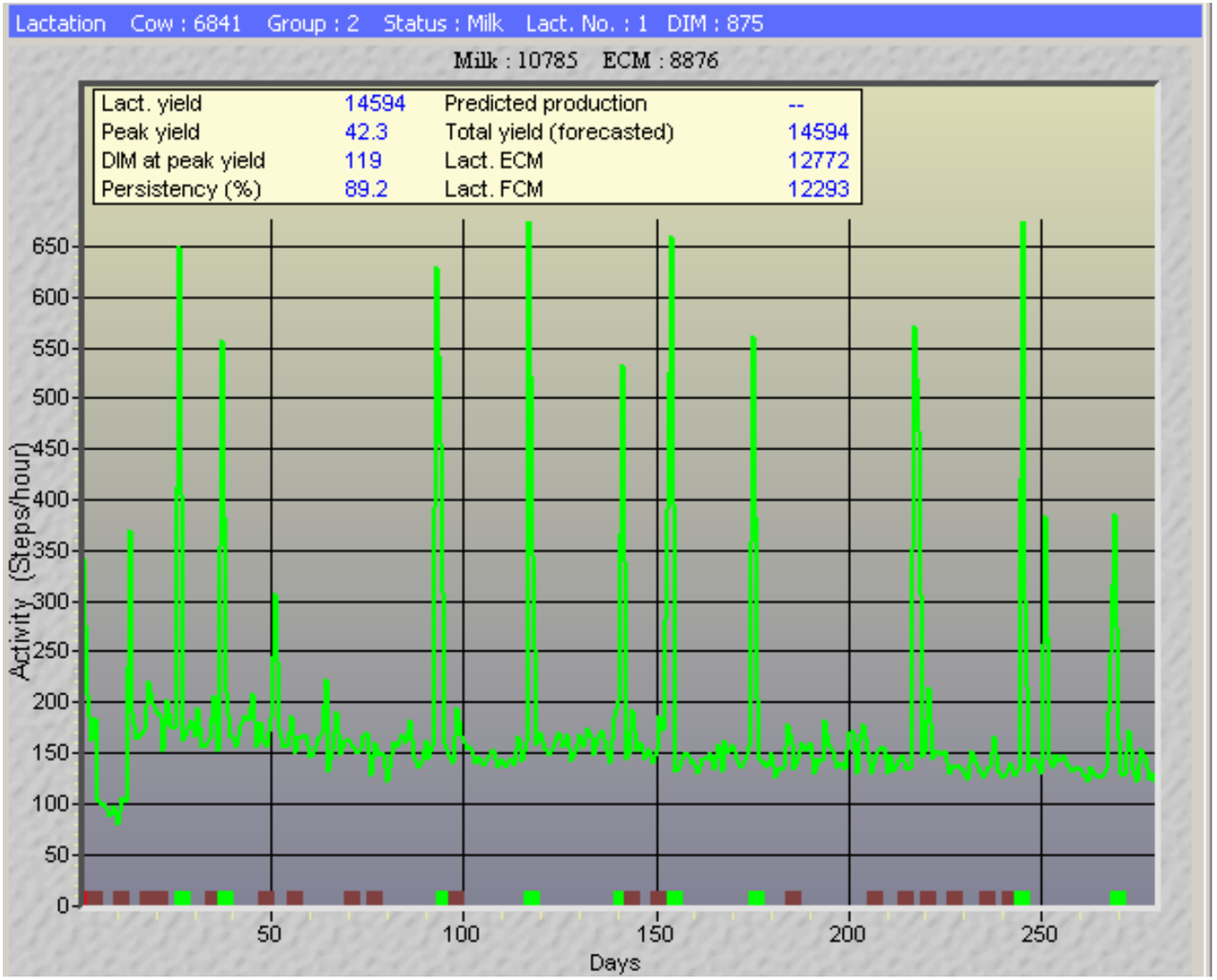
Save | Save As... | Design | Refresh | Fertility Report (by Inseminator)

Inseminator's name	1st normal insem.	∇1 CR 1st insem.	2+ more normal insem.	CR 2+ insem.	Heifers (pre)	Cows	Total normal insem.	Heifers (pre) CR	Cows CR	CR total	Insem. without follow-up	Double insem.	Total insem.
Randy	569	39.72	727	39.48	--	1296	1296	--	39.58	39.58	18	97	1314
Chalk	250	39.20	483	39.54	--	733	733	--	39.43	39.43	8	17	741
Pedro D	47	38.30	54	24.07	--	101	101	--	30.69	30.69	6	--	107
Jim Parsch	42	38.10	129	44.96	--	171	171	--	43.27	43.27	1	3	172
Marcia	198	32.83	369	38.75	--	567	567	--	36.68	36.68	6	35	573
Ross	50	22.00	--	--	--	50	50	--	22.00	22.00	1	--	51
Ryan Kuhl	122	18.03	138	34.06	1	259	260	100.00	26.25	26.54	3	--	263
Juan	95	16.84	2	--	--	97	97	--	16.49	16.49	1	--	98

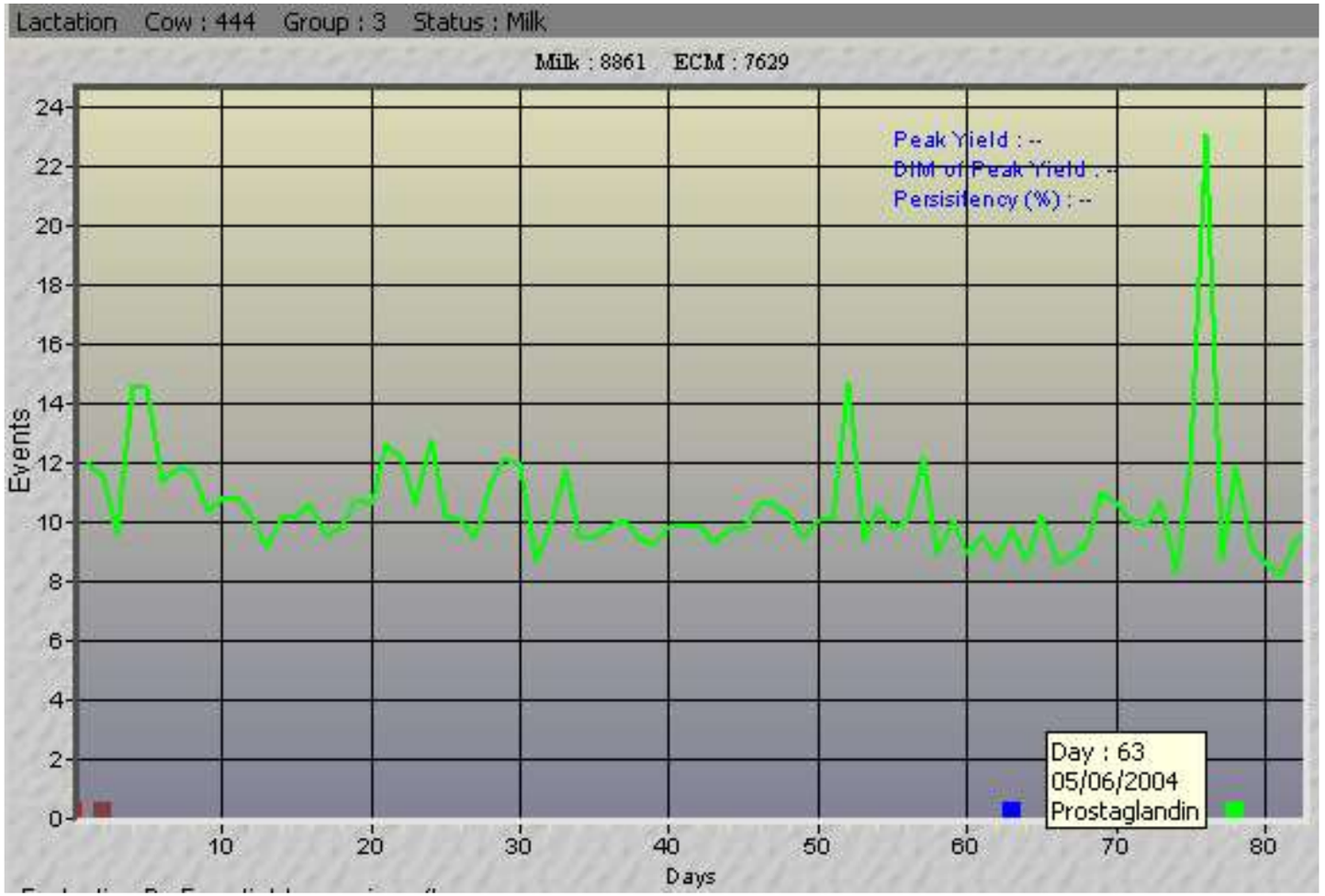
Praćenje i pregled plodnosti

- Optimiranje MTR-a
- Otkrivanje kava sa folikularnim cistama
- Otkrivanje anestrusa i tihog gonjenja
- Otkrivanje pobačaja
- Hipofunkcija jajnika

Krava sa folikularnom cistom (nymphomania) povećana učestalost povećanja broja koraka

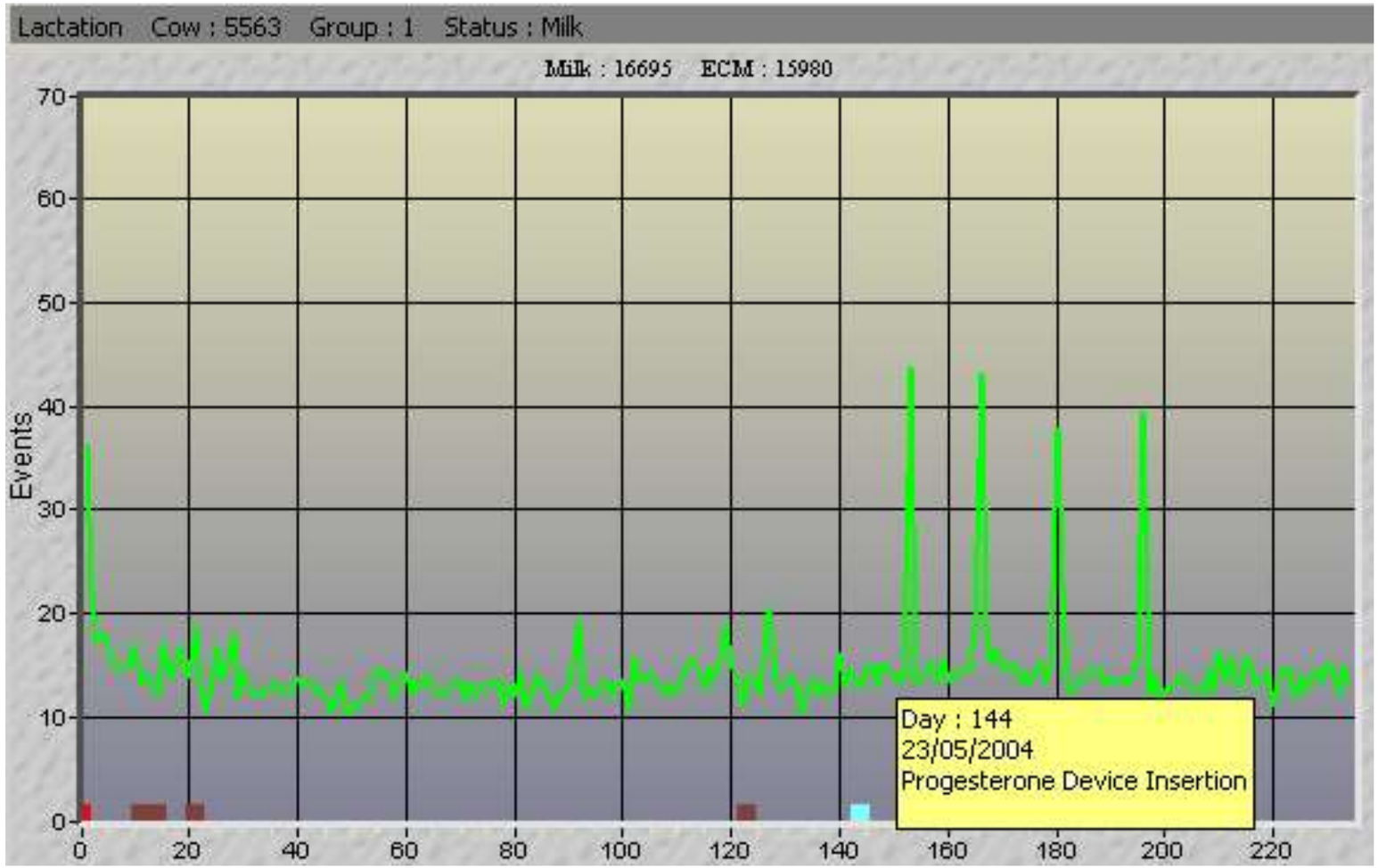


USPJEŠNA TERAPIJA ANESTRUSA



» Nije se vidljivo gonila, utvrđeno da ima žuto tijelo, 63. dan apliciran PGF, nakon čega je uspješno uspostavljen ciklus

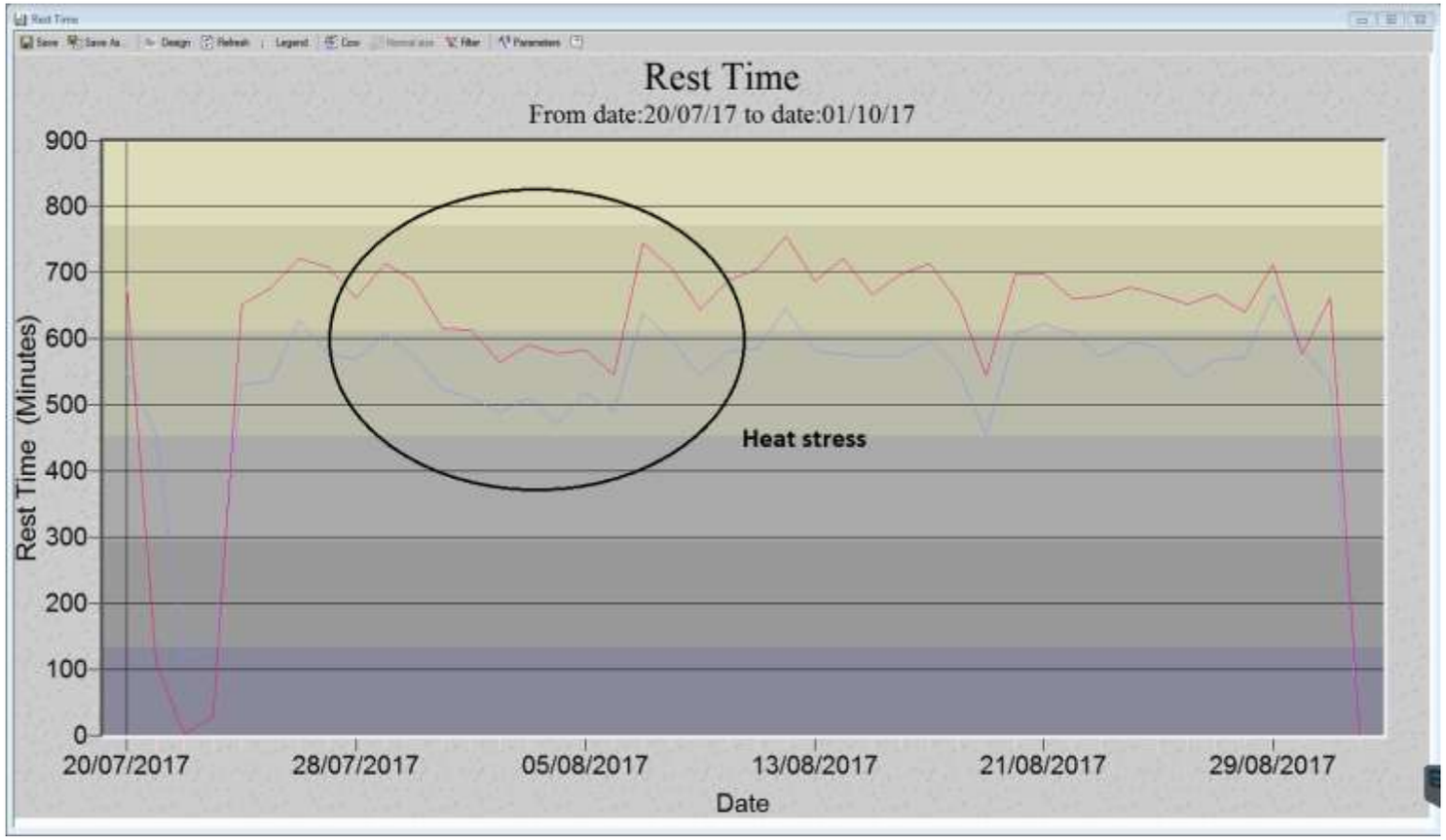
USPJEŠNA TERAPIJA HIPOFUNKCIJE JAJNIKA



Krava koja nije bila u ciklusu do 140. dana, pregledana je i 144. dana je postavljen PRID, nakon čega se uredno gonila…

VRIJEME ODMARANJA NASPRAM PROIZVODNJA MLIJEKA

August 2017.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
liters/milked cow	33,6	32,26	31,15	31,04	31,06	30,95	30,85	32,09	31,64	31,65	31,68	32,45	32,57	32,48	32,48	32,16	33,03	32,92	33,03	32,65	32,11	32,12	32,94	32,51	32,3



Sano

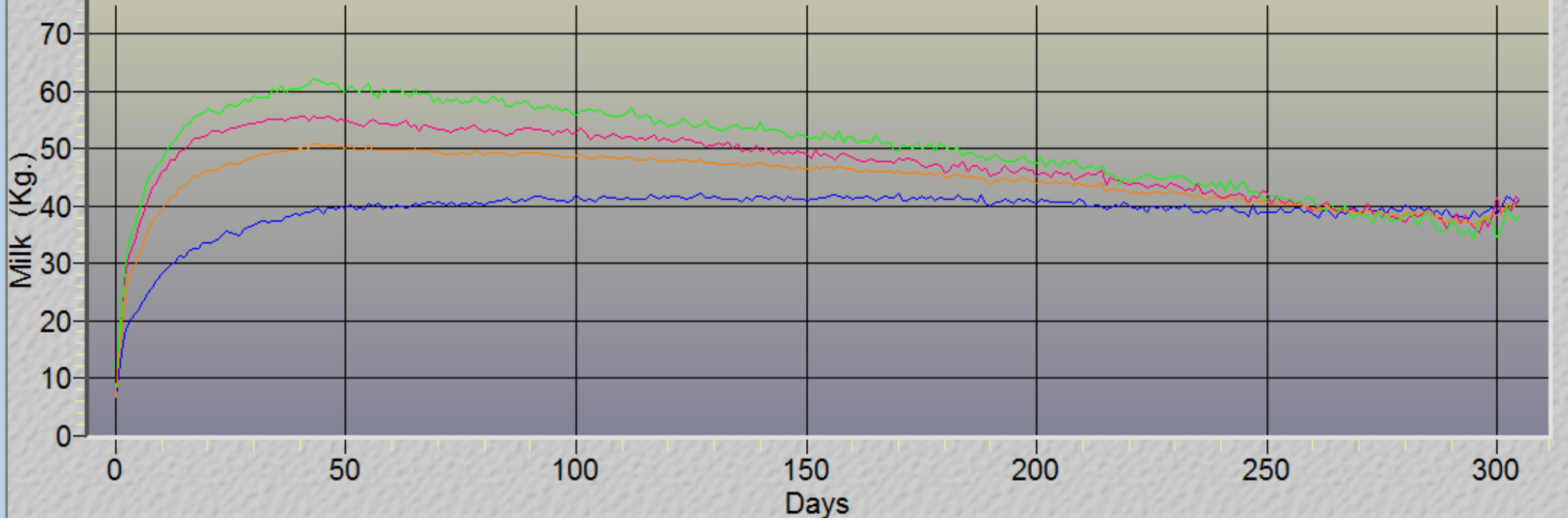
Milk by Lactation

Save | Save As... | Design | Refresh | Legend | Cow | Normal size | Filter | Parameters

Milk by Lactation

Current lactation, Period (days):305

	Milk	Peak Yield	DIM at Peak Yield
Milk + Dry	13611	50.6	46
Lactation 1	11963	41.6	119
Lactation 2	14421	55.5	46
Lactation 3+	15228	61.6	46



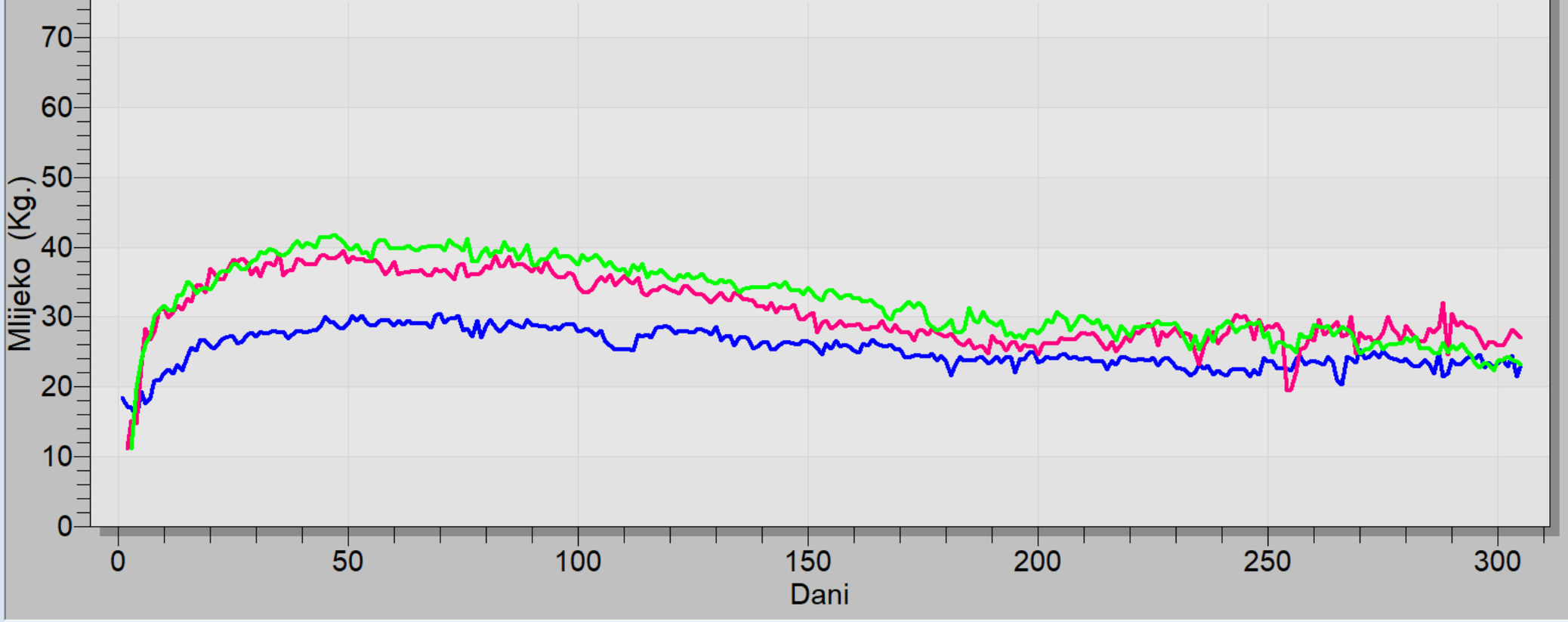
Mlijeko po laktaciji

Sačuvati | Sačuvati kao... | Dizajnirati | Osvježiti | Legenda | Krava | Normalna veličina | Filter | Parametri

Mlijeko po laktaciji

Aktualna laktacija, Period (dani):305

	Mlijeko	Vrh proizvodnje	DUL kod vrha proizvodnje
Laktacija 1	7745	29.9	72
Laktacija 2	9397	38.8	48
Laktacija 3+	9822	41.4	47



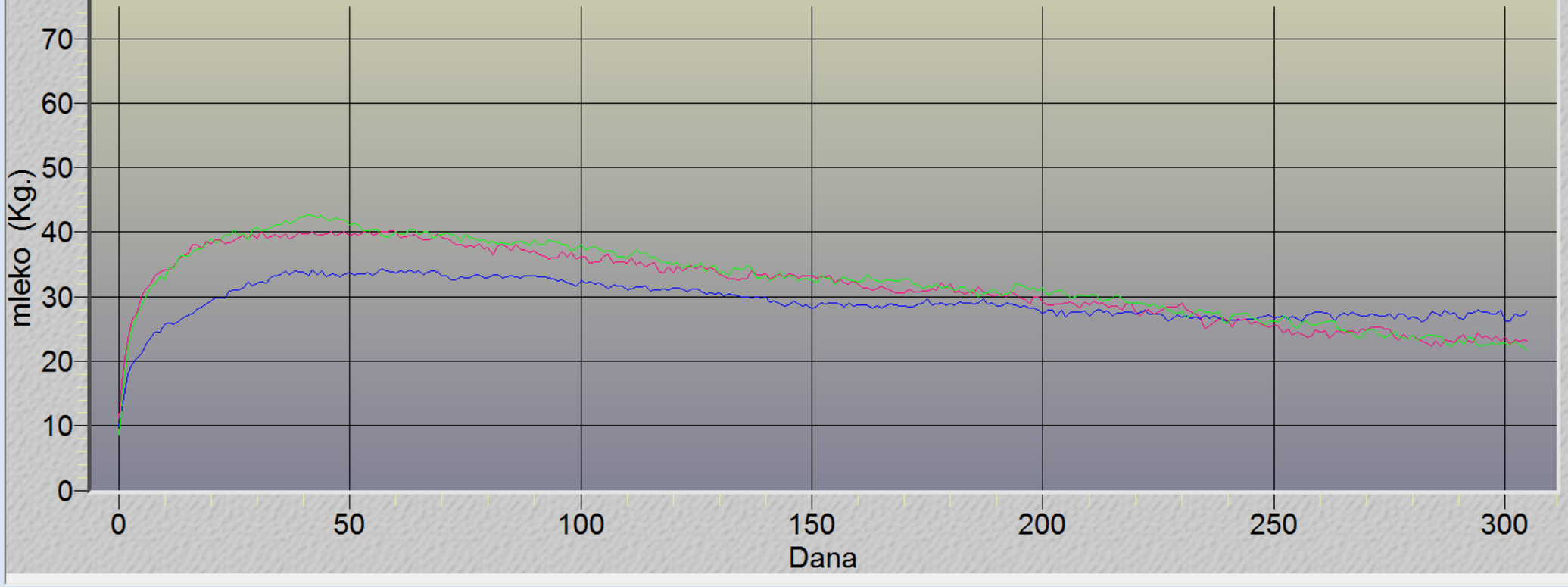
Mleko po laktaciji

SAčuvaj | sačuvaj kao ... | Koncepcija | ažuriraj | Legenda | Krava | normalna veličina | Filter | Parametari

Mleko po laktaciji

Sadašnja laktacija, Period (dana):305

	mleko	najveća mlečnost	DUM najvišeg prinosa
Laktacija 1	8946	34.0	60
Laktacija 2	9715	40.0	59
Laktacija 3+	9915	42.5	43



“Šta nam muzači rade?”

La méridienne ou la sieste (d'après Millet)
Vincent Van Gogh

afimilk

Design | Refresh | Add to schedule | View | Reports

Legend | Graph | Normal Size

Date	Session	Milked Cows	Milk/ cow	% Milk 2 min	AMT	AMT target	Flow Rate 0 - 15	Flow Rate 15 - 30	Flow Rate 30 - 60	Flow Rate 60 - 120	Low flow time	Pre. low flow time	Low flow time removal	Milking bimodality	Irregular take off	Manual milking	Multiple att	Unnece-ssary attach.	Kick off
07/11/2017	3	812					0.48	1.77	0.99	2.63	1.23	0.30	0.93	668	18	17	90	44	12
07/11/2017	2	829					0.44	2.40	1.97	3.58	1.01	0.26	0.75	511	9	14	38	20	19
07/11/2017	1	811					0.58	2.30	1.53	2.87									
Sub Sum	3	15106					--	--	--	--									
Sub Sum	2	15893					--	--	--	--									
Sub Sum	1	15214								--									
Total	--	46213								--									
Sub avg.	3	795	10.8	36.4	4.8	4.3	0.5			2.79	1								
Sub avg.	2	795	12.7	37.2	5.0	4.8	0.45	2.19	1.62	3.27	1								
Sub avg.	1	801	13.8	34.6	5.2	5.0	0.50	2.43	1.75	3.16	1								
Avg.	--	797	12.4	36.1	5.0	4.7	0.49	2.14	1.49	3.08	1								

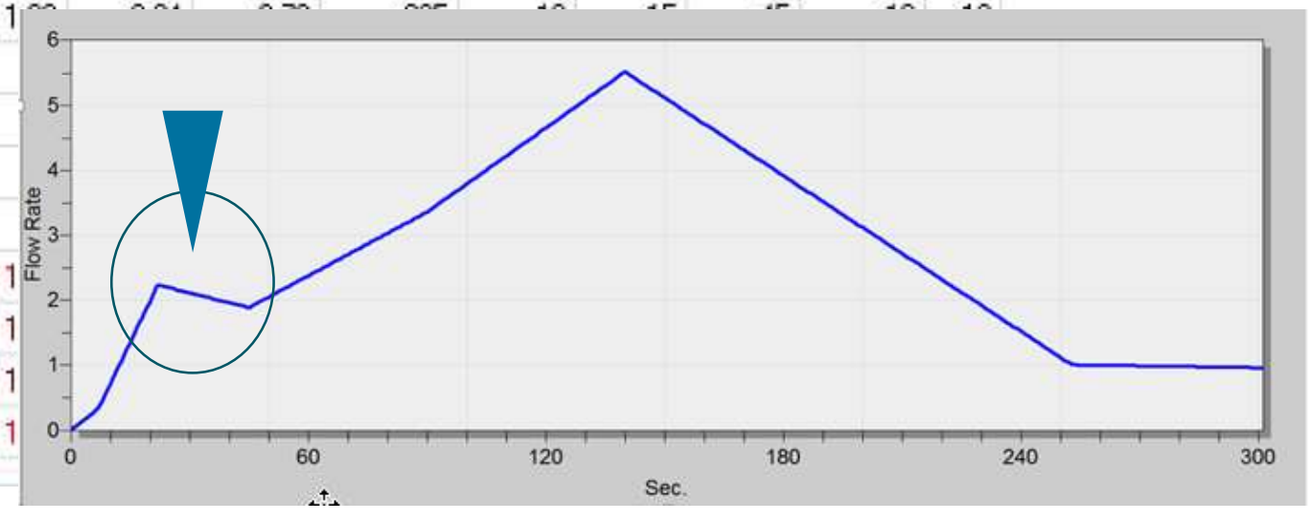
0.5-1.5 kg\mn
1-3 Lb\mn

1.5-2.5 kg\mn
3-6 LB\mn

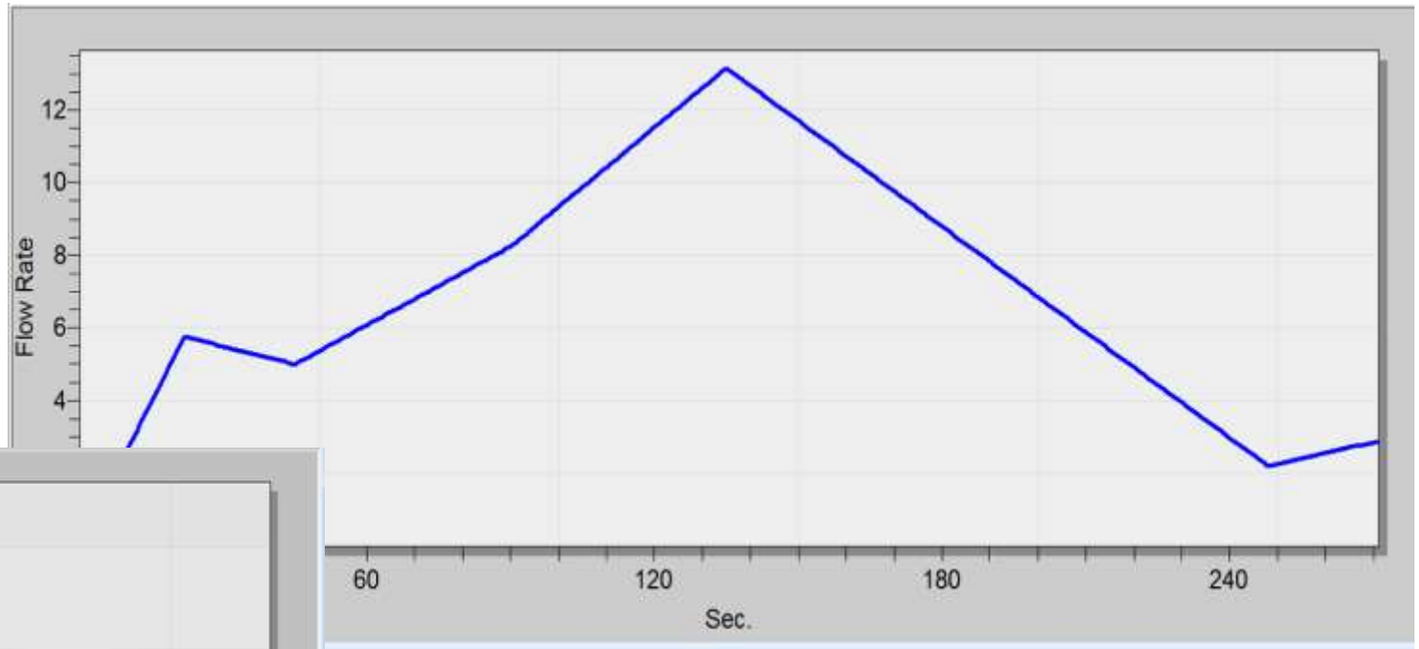
2.5-3.5 kg\mn
6-8 LB\mn

3.5-4.5 kg\mn
8-10 LB\mn

Bimodality



Prije


Flow Rate
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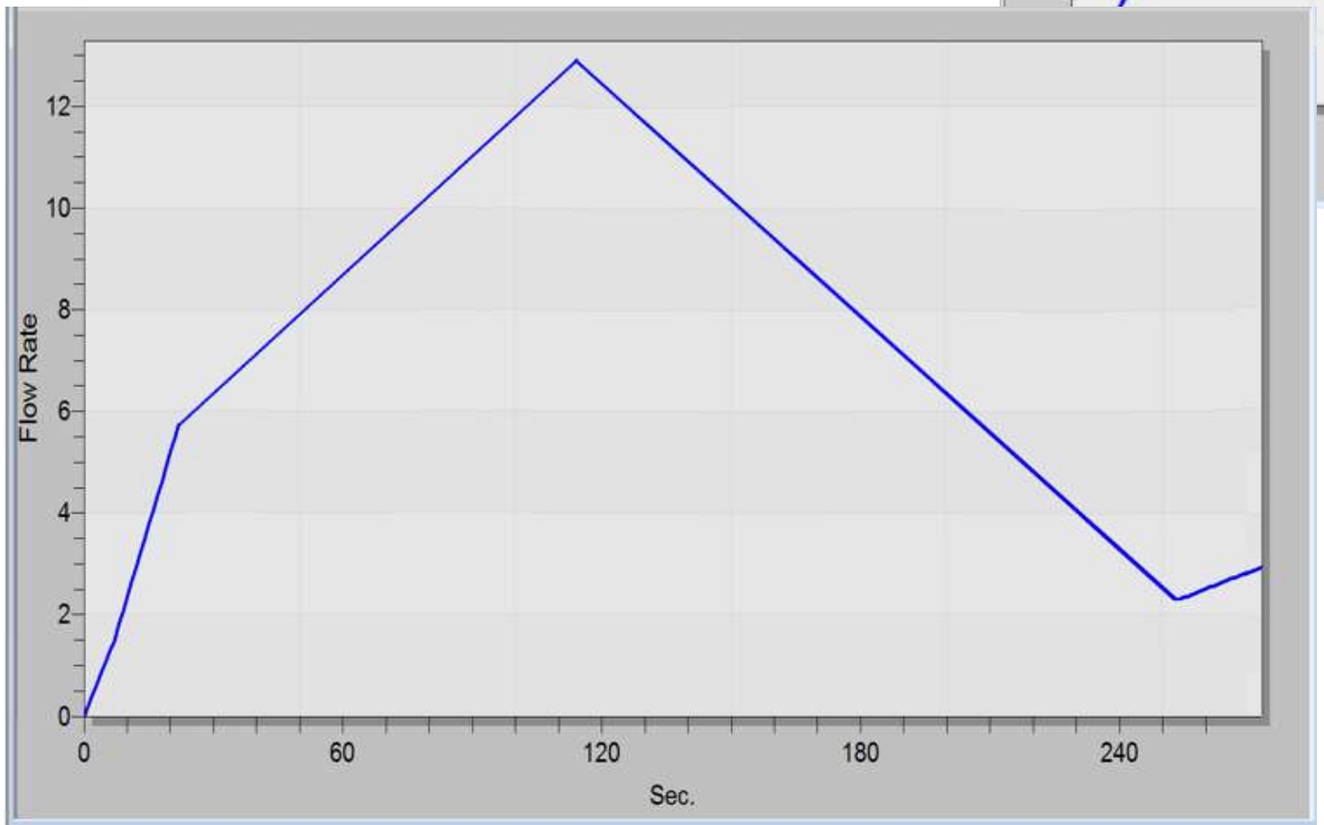
Flow Rate
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Sec.

Nakon

MENADŽMENT

- **konkurentnost**
  - **To znači - biti sposoban cijenom i kvalitetom održati se na tržištu**
  - **To znači -** povećati broj litara proizvedenog mlijeka/životinja
  - **To znači -** sniziti trošak/litra mlijeka

MENADŽMENT

- **INVESTICIJE**
- **Da li se isplati?**
- **DA, ako se povećanim profitom investicija isplati u razumnom roku**

MENADŽMENT

MENADŽMENT

TKO SI TO MOŽE PRIUŠTITI…?

- Štete od ketoze > 100€/kravi/godišnje
- Štete od mastitisa > 115€/kravi/godišnje
- Štete od acidoze > 80€/kravi/godišnje
- Štete od neučinkovitom hranidbom = ???
- Štete od nedovoljno kvalitetne hrane = ???
- Štete od neadekvatne i neprecizne mužnje = ???

Show me the money!
afimilk

PRIMJER FINANCIJSKOG EFEKTA INSTALACIJE SOFTVERA, PRECIZNE ISHRANE I MUŽNJE KRAVA

Period primjene sustava:
→ Sustav za reprodukciju od 20.3.2017. – 20.12.2017. → 9 mjeseci
→ nadopunjeno sa hranidbom 29.10.2017. – 24.1.2018. → 97 dana

180 krava pasmine HF; 160 krava u laktaciji ; 20 krava u suhostaju
Izmuzište 2x5 HB
Prije instalacije Afimilk sistema i prelaska na SANO koncept:
- prosječna proizvodnja mlijeka po kravi u st. laktaciji od 305 dana iznosila je 7.800 kg
Cilj: povećanje proizvodnje mlijeka u standardnoj laktaciji na 10.000 kg i više

SERVIS PERIOD 156 DANA

Isplativost investicije u automatizaciju izmuzišta i uvođenje sw menadžmenta

NAZIV	kom.
Afimilk MPC mljekometar	10
ACR – automatski skidači sisnog sklopa	10
Ideal	1
Komunikacijska i spojna oprema	1

NAZIV	kom.
AfiAct II čitač	1
AfiAct II pedometar	180
Odstojnik	1
Softver	1

TOTAL

INVESTICIJA 60.000,00€

Pokazatelj	Cijena
Cijena 1 l mlijeka bez subvencije	0,32 €
Razlika u l mlijeka/kravi sa i bez SANO koncepta hranidbe	32,9 l – 25,4 l = 7,5 l
Cijena 1 hranidbenog dana sa SANO konceptom za krave u laktaciji	5,13 €
Cijena 1 hranidbenog dana prije prelaska na koncept	4,80 €
Razlika u cijeni koštanja obroka	5,13 € - 4,80 € = **+ 0,33** €
Broj krava u laktaciji x razlika u cijeni koštanja obroka	160 x 0,33 € = 52,80 €
Broj krava u laktaciji x razlika u l mlijeka/kravi x cijena 1 l mlijeka	160 x 7,5 x 0,32 = 384 €
GODIŠNJE POVEĆANJE PRIHODA	(384 € - 52,80 €) X 365 = 120.888 €

20.3. - Servis period 176 dana

Fertility Report (General) (20/01/2017 - 20/02/2017)

Save | Save As... | Design | Refresh | Fertility Report (General)

	Heifers (pre)	Heifers (pre) %	1st lact.	1st lact. %	2nd lact	2nd lact. %	3+ lact.	3+ lact. %	All cows	All cows %	Total	Total %
Sums and Averages												
Calving Interval					469		417		441			
Total of confirmed pregnancies	15	68.18	12	66.67	7	63.64	10	52.63	29	60.42	44	62.86
Avg. days open	16.34		204		149		161		176			
Avg. days to first service	16.01		104		79		75		84			
Avg. Wasted Days	27		120		53		77		89		68	
Open more then 150 DIM			--	--	1	14.29	2	28.57	3	12.00		
Avg. inseminations per cow	1.05		1.06		1.00		1.00		1.02		1.03	
Avg. inseminations per pregnancy	1.40		2.83		2.14		3.00		2.72		2.27	

Servis period neposredno nakon instalacije

20.12. - Servis period 156 dana

Fertility Report (General) (20/03/2017 - 20/12/2017)

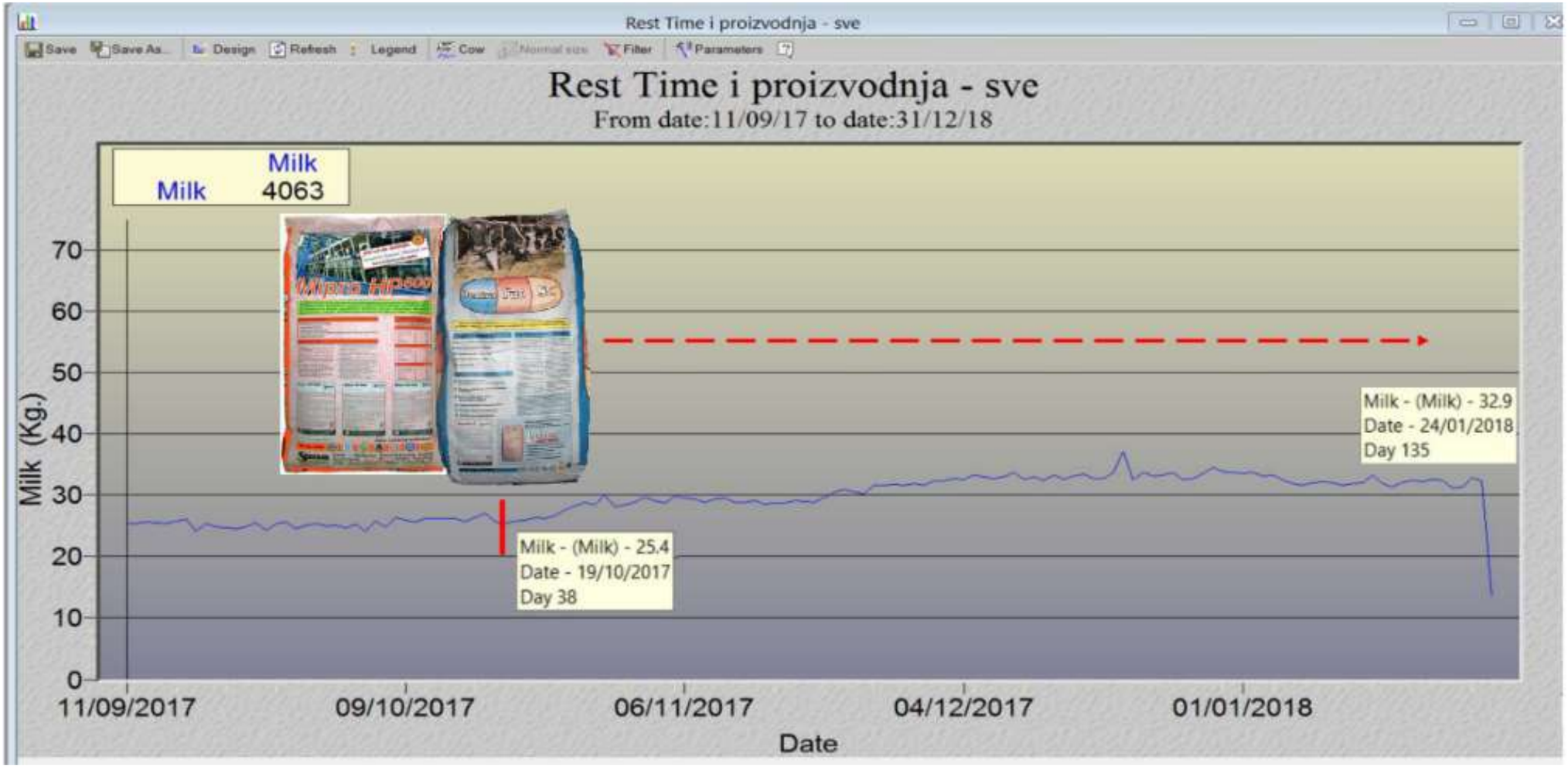
Save | Save As... | Design | Refresh | Fertility Report (General)

	Heifers (pre)	Heifers (pre) %	1st lact.	1st lact. %	2nd lact	2nd lact. %	3+ lact.	3+ lact. %	All cows	All cows %	Total	Total %
Sums and Averages												
Calving Interval					441		425		431			
Total of confirmed pregnancies	48	87.27	34	75.56	25	67.57	25	50.00	84	63.64	132	70.59
Avg. days open	16.27		158		141		168		156			
Avg. days to first service	14.86		85		83		86		85			
Avg. Wasted Days	45		73		56		81		70		61	
Open more then 150 DIM			12	30.77	4	13.33	14	46.67	30	30.93		
Avg. inseminations per cow	1.56		2.73		2.05		2.12		2.31		2.09	
Avg. inseminations per pregnancy	1.79		2.97		2.44		2.88		2.79		2.42	

Servis period 9 mjeseci nakon instalacije

Servis period skraćen za 20 dana u periodu od 9 mjeseci!!!

PRELAZAK NA PRECIZNU ISHRANU



FINANCIJSKI EFEKT INSTALACIJE SOFTVERA I PRECIZNE ISHRANE

	PROIZVODNJA L/DAN	PROIZVODNJA L/GODINU	CIJENA OBROKA EUR/DAN	PROIZVODNA CIJENA EUR/LITRA	TROŠAK/STADO EUR/GOD	ZARADA/STADO EUR/GOD
Stanje prije instalacije	25,4	1.483.360	4,8	0,19	281.838	192.837
Stanje poslije instalacije	32,9	1.921.360	5,13	0,15	288.204	327.128
Razlika	7,5	438.000	0,33	0,04	10.804	133.287

Hvala na pažnji!