

**SUMATRAN RHINO CONSERVATION CENTRE
DEPARTMENT OF WILDLIFE AND NATIONAL PARKS
SUNGAI DUSUN, SELANGOR
MALAYSIA**

MONTHLY REPORT

DECEMBER 2002

BY

Dr. AIDI MOHAMAD

&

STEVE ROMO

INTRODUCTION

Two breeding occurred when Ara bred Rima and Seputeh this month. The other three females showed no positive behaviour although they were mixed with the male on regular basis. Seputeh was bred on Dec. 4 and Rima was on Dec. 17 respectively.

Blood sample were collected as usual, twice weekly and the samples were sent to UPM for hormonal analysis. Blood was also sent to Veterinary Research Institute, Ipoh for routine checking.

As for Minah, she was weighed weekly and her weight improved a lot after giving her the 'Equine Senior' pellet. Her weight has been up and she looked more active and alert. The other rhinos are also in a good health and they were weighed once a month.

RHINO MANAGEMENT

A) Daily Management

i) Night stall

Daily work

Starting this month, Mohd Noor will manage the night stalls together with Shariff and Umor. Shariff and Umor will clean the night stalls daily while Mohd. Noor inspected the food supply when it arrived around 9.30 a.m. The browse and fruits were weighed and cleaned before giving to the rhinos. About 40 to 50 kg of browses and 7kg of fruits including papaya, banana and sweet potatoes were given daily. The rhinos were also given horse pellet about 2.0kg every morning. Every Monday and Thursday morning, blood samples will be collected from all rhinos.

The rhinos

The rhinos were let out first before cleaning the night stalls. After cleaning, the browses were put in the feed trough and the rhinos were let in for their morning meal. The drinking water was changed daily and stress vet (multi-mineral powder) was mixed inside it. Daily observation was made and recorded in the workbook for each rhino. The rhinos were fed twice daily: 9.00 a.m. and 3.00 p.m.

ii) Ten acres enclosure

Daily Work

Adam will inspect the electric fencing every morning. The fencing will be cleaned from any foreign objects such as spider web, dried leaves or creepers to avoid short circuit. Voltmeter was used to ensure that the voltage of the fencing is about 7.0 kV. They will also inspect the fencing for any damages.

During the inspection, the ranger will look for the rhino inside the enclosure and call the rhino for their morning meal. The rhino was confined in the quarter acre first before putting their browse in the feeding trough. The amount given was about 100kg for each rhino per day.

B) Breeding Program

i) Breeding Introduction

a) Rima

Starting from Dec 14, Rima was mixed with Ara. No breeding behaviour observed until Dec 16. Ara followed Rima but she looked in her early stage of estrus. On Dec 17, Rima was scanned and her follicle is about 19 to 20mm. She was then mixed with Ara and showed some breeding behaviour. The rhinos were mixed again in the afternoon and Ara bred Rima for 7 and 15 minutes respectively.

b) Seputeh

Ara bred Seputeh on Dec 4 after mixing them starting from Dec. 2. Some interest observed on Dec. 3 but the breeding took place the next day for 52 minutes.

c) Panjang

Panjang was mixed on daily basis to stimulate to cycle. No positive behaviour observed and her P4 level is low between 0.09ng/ml to 0.21ng/ml throughout the month.

d) Mas Merah

Mas Merah progesterone profile is irregular. Her hormone level fluctuated between 0.46ng/ml to 0.81ng/ml. She was mixed with Ara daily but she blowing and vocalizing during the mixing.

e) Minah

Minah was also mixed on regular basis but no breeding occurred. Her progesterone level is also low between 0.01ng/ml to 0.09ng/ml.

ii) Bleeding Program

a) Blood Collection

The blood collection was carried out twice weekly, every Monday and Thursday. The bleeding procedure was summarized in Table 1.

b) Progesterone Hormone Profile

Blood samples were sent to UPM for hormonal analysis and the latest blood result was attached below.

C) HEALTH STATUS

Minah showed an improvement and her weight is being monitored on weekly basis. The result is tabulated in Table 4. The other rhinos were weighed once a month.

Table 3: Rhinos' Body Weight (Kg), December 2002

Month/ Rhino ID	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
RIMA	552	542	542	554	580	576	562		558	580	606	*
MAS MERAH	612	590	578	586	595	594	584		602	600	630	632
MINAH	462	450	476	476	480	450	458		442	466	492	495
SEPUTIH	738	752	742	736	*	724	764		776	*	758	758
PANJIANG	532	*	523	512	538	514	528		526	526	534	535
ARA	610	588	574	574	613	592	634		630	626	644	610

*Inside the 10 acres enclosure

Table 4: Minah's Weekly Body Weight (Kg), December 2002

Rhino ID / Date	4/12	13/12	18/12	24/12	2/1
Minah	495	490	498	495	496

Table 1: Blood Collection from the Rhinos, December 2002

Date	Rhino ID	Area taken	Remarks
Dec 2	Mas Merah Rima Minah Panjang Seputeh	Tail Tail Tail Tail Tail	Samples were taken from two females for P4 analysis.
Dec 4	Panjang Minah Mas Merah	Tail Tail Tail	Samples were taken from the females for P4 analysis.
Dec 10	Rima Minah Mas Merah Panjang Seputeh	Tail Tail Tail Tail Tail	Blood was taken for P4 analysis
Dec 13	Minah Panjang Mas Merah Rima	Tail Tail Tail Tail	Samples were taken from all rhinos for P4 analysis.
Dec 17	Mas Merah Minah Seputeh Panjang	Tail Tail Tail Tail	Samples were taken from the females for P4 analysis.
Dec 19	Minah Panjang Mas Merah Rima Seputeh	Tail Tail Tail Tail Tail	Samples were taken from the females for P4 analysis.
Dec 30	Minah Seputeh Rima Panjang Mas Merah	Tail Tail Tail Tail Tail	Blood was taken for the P4 analysis

Table 2: Observation on the Rhinos During Introduction, December 2002

Date	Rhino ID	Observation
Dec 2	Seputeh & Ara	Seputeh wanted to fight with Ara. Head butting was observed throughout the period.
	Minah & Ara	No interest observed.
Dec 3	Minah & Ara	No interest observed between the two rhinos.
	Seputeh & Ara	Some interest observed. Mounting and head butting when mixed in the afternoon.
	Panjang & Ara	No interest observed.
Dec 4	Seputeh & Ara	Ara bred Seputeh for 52 minutes.
Dec 14	Rima & Ara	No interest observed between the two rhinos.
Dec 15	Rima & Ara	No interest observed between the two rhinos.
Dec 16	Rima & Ara	Positive behaviour observed but Rima looked early.
Dec 17	Rima & Ara	Some breeding behaviour observed in the morning. Ara bred for 7 and 15 minutes respectively in the afternoon.
Dec 19	Minah & Ara	No interest observed.
	Mas Merah & Ara	Mas started to blow when approaching the feeding area.
Dec 20	Minah & Ara	Ara sniffed Minah but no further response.
	Mas Merah & Ara	Mas vocalized and blowing when saw Ara
	Panjang & Ara	No interest observed
Dec 30	Seputeh & Ara	No interest observed.
Dec 31	Minah & Ara	No interest.
	Mas Merah & Ara	Vocalized a lot and wanted to fight
	Panjang & Ara	No interest.
	Seputeh & Ara	Head butting and some aggression

Sumatran Rhinoceros Hematology Summary; Sungai Dusun, December 2002

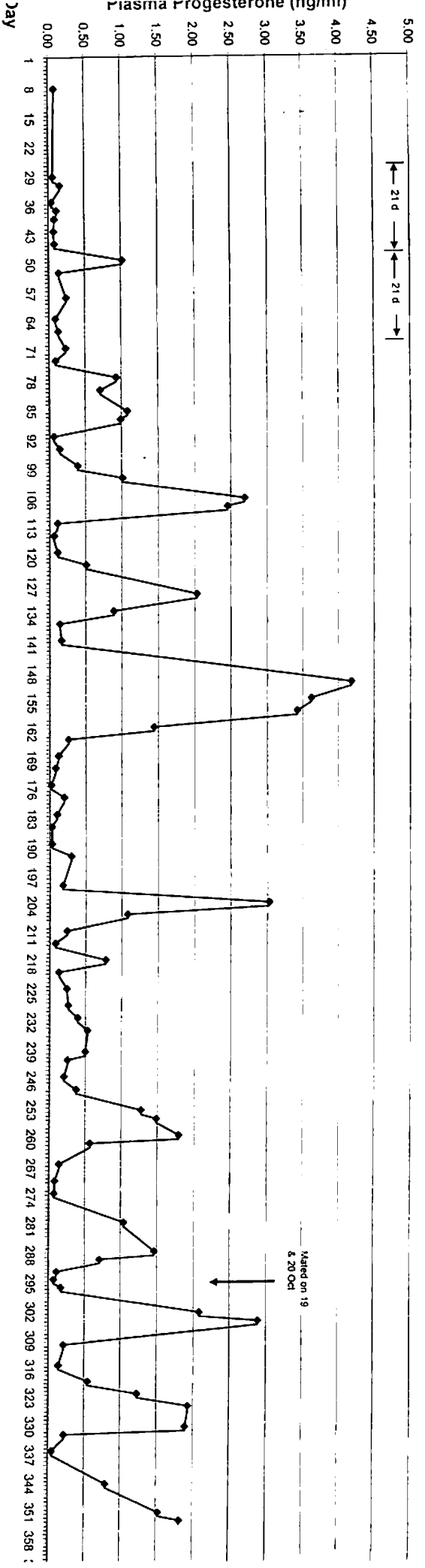
Hematology Parameter	Unit	MINAH	RIMA	ARA	MAS MERAH	SEPUTIH	PANJANG
White blood cell count	(x 10 ³ ul)	10.0	10.0	5.7	10.2	9.7	9.4
Red blood cell count	(x 10 ⁶ ul)	4.87	4.56	4.59	4.31	5.50	3.01
Hemoglobin	(g/dl)	13.9	12.6	12.7	11.7	15.6	9.0
PCV	(%)	37.8	33.6	34.0	32.2	42.1	24.0
MCV	(u ³)	77.6	73.6	74.1	74.8	76.5	79.6
MCH	(p.g.)	28.5	27.6	27.7	27.1	28.4	29.9
MCHC	(g/dl)	36.8	37.5	37.4	36.3	37.1	37.5
Neutrophils	(%)	67	82	24	67	65	65
Lymphocytes	(%)	27	15	68	19	23	28
Monocytes	(%)	3	2	0	0	2	1
Eosinophils	(%)	3	1	8	14	10	6
Basophils	(%)	0	0	0	0	0	0
Blood Protozoa		NEG	NEG	NEG	NEG	NEG	NEG

Remarks: RBC and PVC slightly low

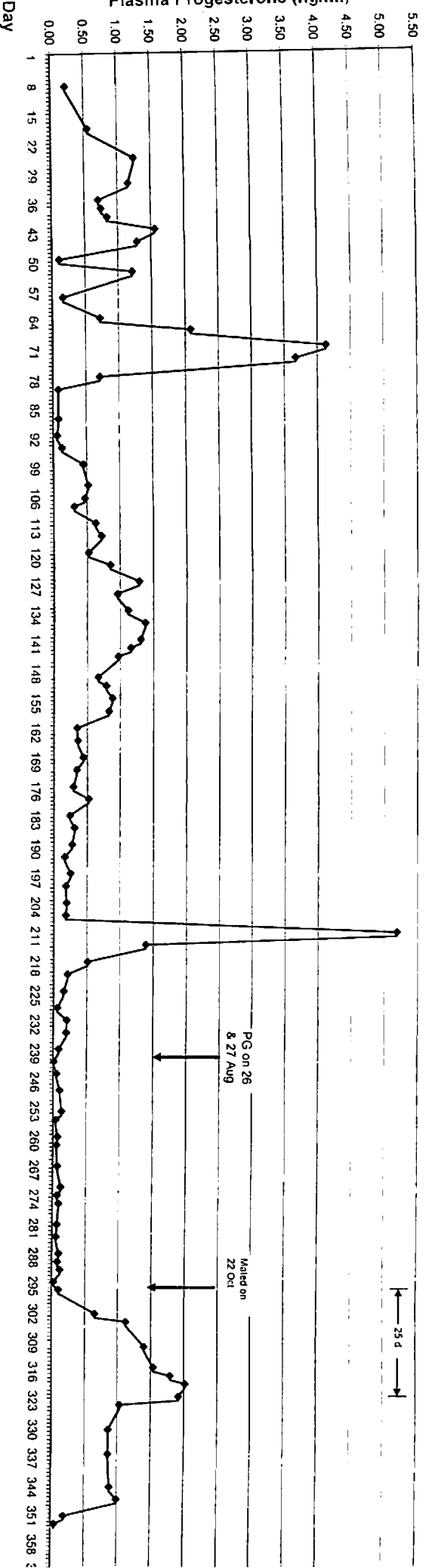
Sumatran Rhinoceros Biochemistry Summary; Sungai Dusun, December 2002

Parameter	MINAH	RIMA	ARA	MAS MERAH	SEPUTEH	PANJANG
Alkaline Phosphate (U/L)	81.00	40.00	62.00	84.00	80.00	95.00
Amylase (U/L)	20.00	0.00	48.00	36.00	70.00	36.00
ASAT/GOT (U/L)	75.00	46.00	38.00	107.00	64.00	63.00
ALAT/GPT (U/L)	< 10	<10	<10	<10	<10	<10
Bilirubin, T (umol/L)	2.00	<2	54.00	25.00	19.00	8.00
Calcium (mmol/L)	2.60	2.60	2.47	2.75	2.71	3.14
Cholesterol (mmol/L)	0.91	0.93	0.98	2.75	1.77	2.32
Creatinine (mmol/L)	57.00	99.00	76.00	136.00	71.00	184.00
Gamma-GT (U/L)	76.00	28.00	25.00	16.00	36.00	29.00
Glucose (mmol/L)	4.52	5.64	2.37	5.27	3.68	5.79
LDH (U/L)	1769.00	1041.00	-	1207.00	1065.00	1213.00
Lipase (U/L)	724.00	458.00	330.00	851.00	739.00	149.00
Magnesium (mmol/L)	1.22	1.50	1.19	1.87	1.29	>2.17
NH3 (mmol/L)	207.00	102.00	275.00	129.00	113.00	119.00
Phosphorus (mmol/L)	1.54	1.47	1.85	1.86	0.83	1.26
Protein, Total (g/L)	64.00	68.00	83.00	90.00	69.00	70.00
Albumin (g/L)	26.00	26.00	33.00	26.00	29.00	25.00
Globulin (g/L)	38.00	42.00	50.00	64.00	40.00	45.00
A/G Ratio	0.68	0.61	0.66	0.41	0.72	0.54
Urea-N (mmol/L)	1.45	3.47	3.85	4.18	1.55	3.69
Uric Acid (mmol/L)	<6	<6	69.00	8.00	<6	<6

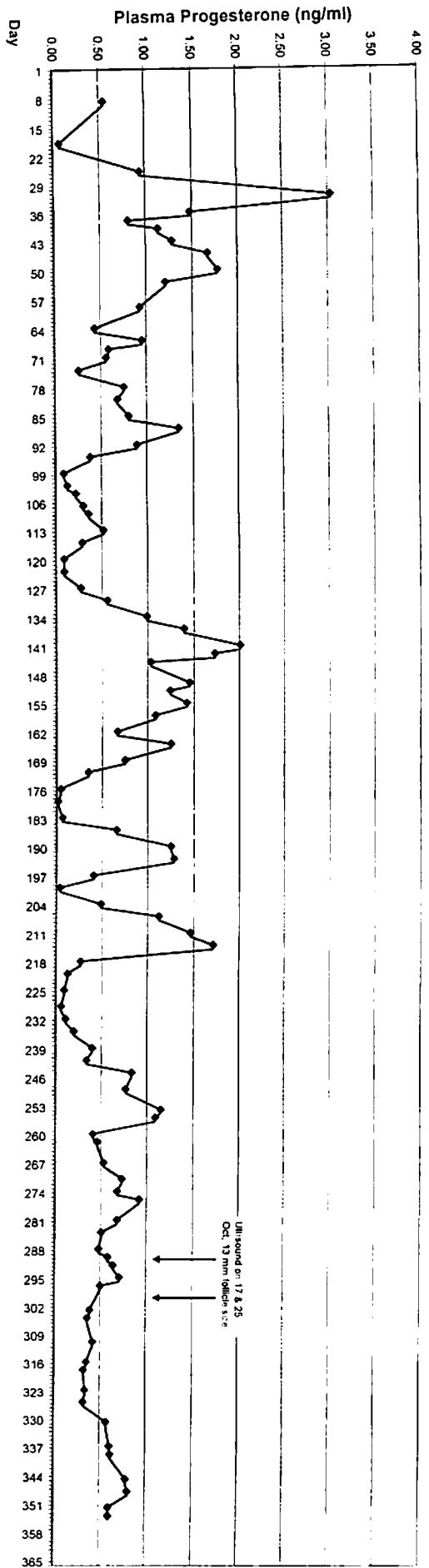
SUMATRAN RHINO - SEPUTIH Plasma Progesterone Profile - 2002



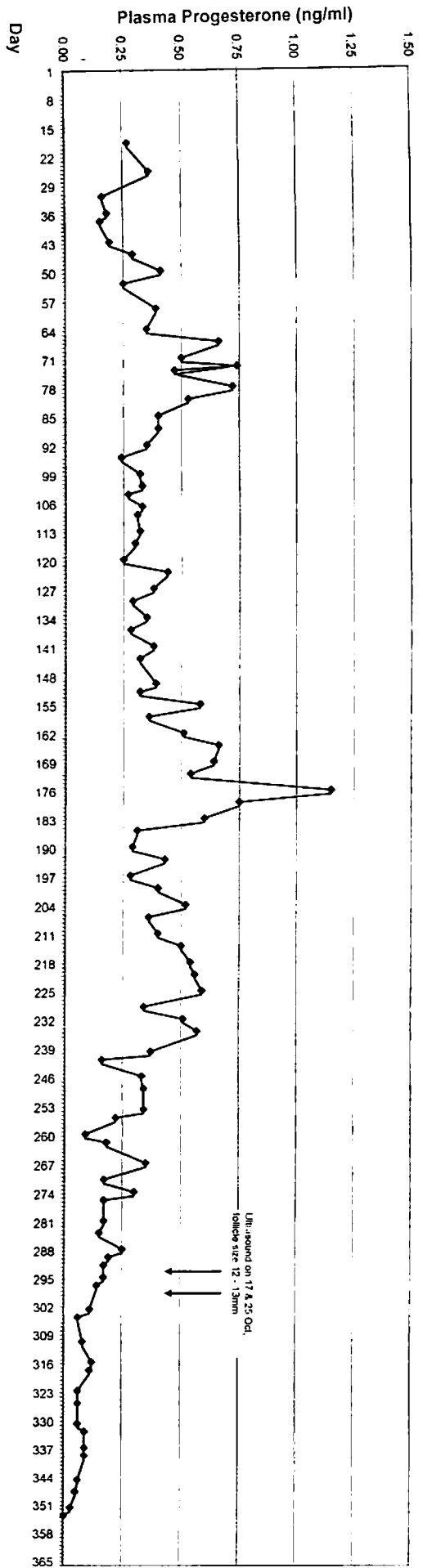
SUMATRAN RHINO - RIMA Plasma Progesterone Profile - 2002



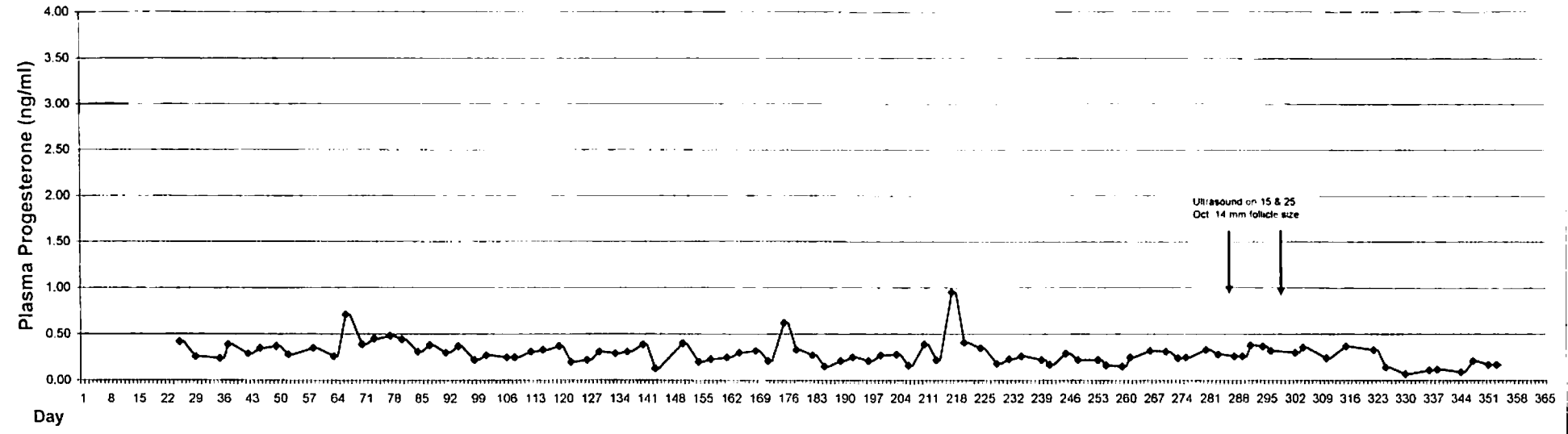
SUMATRAN RHINO - MAS MERAH Plasma Progesterone Profile - 2002



SUMATRAN RHINO - MINAH Plasma Progesterone Profile - 2002



SUMATRAN RHINO - PANJANG Plasma Progesterone Profile - 2002



Mas Merah			Minah			Panjang			Rima			Seputh			
Date	Day	P4 (ng/ml)	Date	Day	P4 (ng/ml)	Date	Day	P4 (ng/ml)	E2 (pg)	Date	Day	P4 (ng/ml)	Date	Day	P4 (ng/ml)
1-Oct-02	274		1-Oct-02	274		1-Oct-02	274			1-Oct-02	274		1-Oct-02	274	
2-Oct-02	275	0.92	2-Oct-02	275	0.17	2-Oct-02	275	0.25		2-Oct-02	275	0.09	2-Oct-02	275	
3-Oct-02	276		3-Oct-02	276		3-Oct-02	276			3-Oct-02	276		3-Oct-02	276	
4-Oct-02	277		4-Oct-02	277		4-Oct-02	277			4-Oct-02	277		4-Oct-02	277	
5-Oct-02	278		5-Oct-02	278		5-Oct-02	278			5-Oct-02	278		5-Oct-02	278	
6-Oct-02	279		6-Oct-02	279		6-Oct-02	279			6-Oct-02	279		6-Oct-02	279	
7-Oct-02	280	0.68	7-Oct-02	280	0.17	7-Oct-02	280	0.33		7-Oct-02	280	0.07	7-Oct-02	280	1.04
8-Oct-02	281		8-Oct-02	281		8-Oct-02	281			8-Oct-02	281		8-Oct-02	281	
9-Oct-02	282		9-Oct-02	282		9-Oct-02	282			9-Oct-02	282		9-Oct-02	282	
10-Oct-02	283	0.51	10-Oct-02	283	0.15	10-Oct-02	283	0.28		10-Oct-02	283	0.06	10-Oct-02	283	
11-Oct-02	284		11-Oct-02	284		11-Oct-02	284			11-Oct-02	284		11-Oct-02	284	
12-Oct-02	285		12-Oct-02	285		12-Oct-02	285			12-Oct-02	285		12-Oct-02	285	
13-Oct-02	286		13-Oct-02	286		13-Oct-02	286			13-Oct-02	286		13-Oct-02	286	
14-Oct-02	287	0.48	14-Oct-02	287	0.25	14-Oct-02	287	0.26		14-Oct-02	287	0.10	14-Oct-02	287	1.46
15-Oct-02	288		15-Oct-02	288		15-Oct-02	288			15-Oct-02	288		15-Oct-02	288	
16-Oct-02	289	0.58	16-Oct-02	289	0.19	16-Oct-02	289	0.26		16-Oct-02	289	0.08	16-Oct-02	289	0.71
17-Oct-02	290		17-Oct-02	290		17-Oct-02	290			17-Oct-02	290		17-Oct-02	290	
18-Oct-02	291	0.64	18-Oct-02	291	0.17	18-Oct-02	291	0.38		18-Oct-02	291	0.12	18-Oct-02	291	
19-Oct-02	292		19-Oct-02	292		19-Oct-02	292			19-Oct-02	292		19-Oct-02	292	
20-Oct-02	293		20-Oct-02	293		20-Oct-02	293			20-Oct-02	293		20-Oct-02	293	
21-Oct-02	294	0.71	21-Oct-02	294	0.17	21-Oct-02	294	0.37		21-Oct-02	294	0.03	21-Oct-02	294	0.07
22-Oct-02	295		22-Oct-02	295		22-Oct-02	295			22-Oct-02	295		22-Oct-02	295	
23-Oct-02	296	0.50	23-Oct-02	296	0.14	23-Oct-02	296	0.32		23-Oct-02	296	0.10	23-Oct-02	296	0.17
24-Oct-02	297		24-Oct-02	297		24-Oct-02	297			24-Oct-02	297		24-Oct-02	297	
25-Oct-02	298		25-Oct-02	298		25-Oct-02	298			25-Oct-02	298		25-Oct-02	298	
26-Oct-02	299		26-Oct-02	299		26-Oct-02	299			26-Oct-02	299		26-Oct-02	299	
27-Oct-02	300		27-Oct-02	300		27-Oct-02	300			27-Oct-02	300		27-Oct-02	300	
28-Oct-02	301		28-Oct-02	301		28-Oct-02	301			28-Oct-02	301		28-Oct-02	301	
29-Oct-02	302	0.39	29-Oct-02	302	0.11	29-Oct-02	302	0.30		29-Oct-02	302	0.65	29-Oct-02	302	2.08
30-Oct-02	303		30-Oct-02	303		30-Oct-02	303			30-Oct-02	303		30-Oct-02	303	
31-Oct-02	304	0.36	31-Oct-02	304	0.06	31-Oct-02	304	0.36		31-Oct-02	304	1.12	31-Oct-02	304	2.89
1-Nov-02	305		1-Nov-02	305		1-Nov-02	305			1-Nov-02	305		1-Nov-02	305	
2-Nov-02	306		2-Nov-02	306		2-Nov-02	306			2-Nov-02	306		2-Nov-02	306	
3-Nov-02	307		3-Nov-02	307		3-Nov-02	307			3-Nov-02	307		3-Nov-02	307	
4-Nov-02	308		4-Nov-02	308		4-Nov-02	308			4-Nov-02	308		4-Nov-02	308	
5-Nov-02	309		5-Nov-02	309		5-Nov-02	309			5-Nov-02	309		5-Nov-02	309	
6-Nov-02	310	0.42	6-Nov-02	310	0.08	6-Nov-02	310	0.24		6-Nov-02	310	1.40	6-Nov-02	310	0.21
7-Nov-02	311		7-Nov-02	311		7-Nov-02	311			7-Nov-02	311		7-Nov-02	311	
8-Nov-02	312		8-Nov-02	312		8-Nov-02	312			8-Nov-02	312		8-Nov-02	312	
9-Nov-02	313		9-Nov-02	313		9-Nov-02	313			9-Nov-02	313		9-Nov-02	313	
10-Nov-02	314		10-Nov-02	314		10-Nov-02	314			10-Nov-02	314		10-Nov-02	314	
11-Nov-02	315	0.35	11-Nov-02	315	0.12	11-Nov-02	315	0.37		11-Nov-02	315	1.54	11-Nov-02	315	0.14
12-Nov-02	316		12-Nov-02	316		12-Nov-02	316			12-Nov-02	316		12-Nov-02	316	
13-Nov-02	317	0.32	13-Nov-02	317	0.11	13-Nov-02	317	0.36		13-Nov-02	317	1.79	13-Nov-02	317	
14-Nov-02	318		14-Nov-02	318		14-Nov-02	318			14-Nov-02	318		14-Nov-02	318	
15-Nov-02	319		15-Nov-02	319		15-Nov-02	319			15-Nov-02	319	2.02	15-Nov-02	319	0.55
16-Nov-02	320		16-Nov-02	320		16-Nov-02	320			16-Nov-02	320		16-Nov-02	320	
17-Nov-02	321		17-Nov-02	321		17-Nov-02	321			17-Nov-02	321		17-Nov-02	321	
18-Nov-02	322	0.34	18-Nov-02	322	0.06	18-Nov-02	322	0.33		18-Nov-02	322	1.92	18-Nov-02	322	1.23
19-Nov-02	323		19-Nov-02	323		19-Nov-02	323			19-Nov-02	323		19-Nov-02	323	
20-Nov-02	324		20-Nov-02	324		20-Nov-02	324			20-Nov-02	324	1.03	20-Nov-02	324	
21-Nov-02	325	0.32	21-Nov-02	325	0.06	21-Nov-02	325	0.14		21-Nov-02	325		21-Nov-02	325	1.93
22-Nov-02	326		22-Nov-02	326		22-Nov-02	326			22-Nov-02	326		22-Nov-02	326	
23-Nov-02	327		23-Nov-02	327		23-Nov-02	327			23-Nov-02	327		23-Nov-02	327	
24-Nov-02	328		24-Nov-02	328		24-Nov-02	328			24-Nov-02	328		24-Nov-02	328	
25-Nov-02	329		25-Nov-02	329		25-Nov-02	329			25-Nov-02	329		25-Nov-02	329	
26-Nov-02	330	0.57	26-Nov-02	330	0.06	26-Nov-02	330	0.07		26-Nov-02	330	0.86	26-Nov-02	330	1.89
27-Nov-02	331		27-Nov-02	331		27-Nov-02	331			27-Nov-02	331		27-Nov-02	331	
28-Nov-02	332		28-Nov-02	332		28-Nov-02	332			28-Nov-02	332		28-Nov-02	332	0.22
29-Nov-02	333		29-Nov-02	333		29-Nov-02	333			29-Nov-02	333		29-Nov-02	333	
30-Nov-02	334		30-Nov-02	334		30-Nov-02	334			30-Nov-02	334		30-Nov-02	334	
1-Dec-02	335		1-Dec-02	335		1-Dec-02	335			1-Dec-02	335		1-Dec-02	335	
2-Dec-02	336	0.61	2-Dec-02	336	0.09	2-Dec-02	336	0.11		2-Dec-02	336	0.86	2-Dec-02	336	0.05
3-Dec-02	337		3-Dec-02	337		3-Dec-02	337			3-Dec-02	337		3-Dec-02	337	
4-Dec-02	338	0.62	4-Dec-02	338	0.09	4-Dec-02	338	0.12		4-Dec-02	338		4-Dec-02	338	
5-Dec-02	339		5-Dec-02	339		5-Dec-02	339			5-Dec-02	339		5-Dec-02	339	
6-Dec-02	340		6-Dec-02	340		6-Dec-02	340			6-Dec-02	340		6-Dec-02	340	
7-Dec-02	341		7-Dec-02	341		7-Dec-02	341			7-Dec-02	341		7-Dec-02	341	
8-Dec-02	342		8-Dec-02	342		8-Dec-02	342			8-Dec-02	342		8-Dec-02	342	
9-Dec-02	343		9-Dec-02	343		9-Dec-02	343			9-Dec-02	343		9-Dec-02	343	
10-Dec-02	344	0.79	10-Dec-02	344	0.06	10-Dec-02	344	0.09		10-Dec-02	344	0.88	10-Dec-02	344	0.80
11-Dec-02	345		11-Dec-02	345		11-Dec-02	345			11-Dec-02	345		11-Dec-02	345	
12-Dec-02	346		12-Dec-02	346		12-Dec-02	346			12-Dec-02	346		12-Dec-02	346	
13-Dec-02	347	0.81	13-Dec-02	347	0.05	13-Dec-02	347	0.21		13-Dec-02	347	0.99	13-Dec-02	347	
14-Dec-02	348		14-Dec-02	348		14-Dec-02	348			14-Dec-02	348		14-Dec-02	348	
15-Dec-02	349		15-Dec-02	349		15-Dec-02	349			15-Dec-02	349		15-Dec-02	349	
16-Dec-02	350		16-Dec-02	350		16-Dec-02	350			16-Dec-02	350		16-Dec-02	350	
17-Dec-02	351	0.60	17-Dec-02	351	0.03	17-Dec-02	351	0.17		17-Dec-02	351	0.19	17-Dec-02	351	1.53
18-Dec-02	352		18-Dec-02	352		18-Dec-02	352			18-Dec-02	352		18-Dec-02	352	
19-Dec-02	353	0.60	19-Dec-02	353	0.00	19-Dec-02	353	0.17		19-Dec-02	353	0.05	19-Dec-02	353	1.82
20-Dec-02	354		20-Dec-02	354		20-Dec-02	354			20-Dec-02	354		20-Dec-02	354	
21-Dec-02	355		21-Dec-02	355		21-Dec-02	355			21-Dec-02	355		21-Dec-02	355	
22-Dec-02	356		22-Dec-02	356		22-Dec-02	356			22-Dec-02	356		22-Dec-02	356	
23-Dec-02	357		23-Dec-02	357		23-Dec-02	357			23-Dec-02	357		23-Dec-02	357	
24-Dec-02	358		24-Dec-02	358		24-Dec-02	358			24-Dec-02	358		24-Dec-02	358	
25-Dec-02	359		25-Dec-02	359		25-Dec-02	359			25-Dec-02	359		25-Dec-02	359	
26-Dec-02	360		26-Dec-02	360		26-Dec-02	360			26-Dec-02	360		26-Dec-02	360	
27-Dec-02	361		27-Dec-02	361		27-Dec-02	361			27-Dec-02	361		27-Dec-02	361	
28-Dec-02	362		28-Dec-02	362		28-Dec-02	362			28-Dec-02	362		28-Dec-02	362	
29-Dec-02	363		29-Dec-02	363		29-Dec-02	363			29-Dec-02	363		29-Dec-02	363	
30-Dec-02	364		30-Dec-02	364		30-Dec-02	364			30-Dec-02	364		30-Dec-02	364	
31-Dec-02	365		31-Dec-02	365		31-Dec-02	365			31-Dec-02	365		31-Dec-02	365	