

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

**MONTHLY REPORT**

**APRIL 2003**

**BY**

**Dr. AIDI MOHAMAD**

**&**

**STEVE ROMO**

## INTRODUCTION

The routine procedures including blood collection, ultrasound and rhino mixing were carried out throughout the month, resulted in one breeding i.e. between Ara and Rima.

Ultrasound was conducted on the females including Rima and she had a nice developing follicle (20mm) prior to the breeding. Minah also had an ovulatory follicle but no breeding occurred although she was paired with Ara. As for Panjang, she had follicular activity but the follicle did not growth beyond 14 or 15mm. However, she was also paired with Ara on alternate day basis to stimulate to cycle. Starting on April 28, FSH therapy was conducted on her. Scanning was also conducted on Seputeh but she did not cooperate during the procedure, jumping up and down in the chute. Seputeh was also mixed with Ara but she would like to fight and showing a lot of aggression.

Rima was found dead on April 13, a day after Ara bred her for 51 minutes. No apparent signs were observed on her prior to her death and her behavior was considered normal. Post mortem was carried out with the help from Dr. S. Vellayan and Dr. Vijay from Zoo Negara. Organ samples were sent to UPM and VRI for various tests to investigate the cause of death and the report is being prepared.

Blood sample were collected routinely, two times per week and the samples were sent to UPM for hormonal analysis. Blood was also sent to Veterinary Research Institute (VRI), Ipoh for health check.

## 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 water trough was cleaned and the drinking water was changed on daily basis. 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**

Ara bred Rima on April 12 for 51 minutes and her follicle was about 20mm.

#### **b) Seputeh**

Seputeh is still recovering from her surgery. Her progesterone level was low and she was paired with Ara but showing no interest and wanted to fight.

#### **c) Panjang**

Panjang was mixed on daily basis to stimulate to cycle but no positive behaviour observed. Ultrasound was conducted but her follicle did not grow to an ovulatory follicle.

#### **d) Mas Merah**

Mas Merah was released into the 10 acres enclosure and blood was collected once weekly.

#### **e) Minah**

Minah had an ovulatory follicle but no breeding occurred although she was paired with Ara. Both rhinos showed no interest and they looked like 'playing' together.

## 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.

## 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), April 2003**

Month/ Rhino ID	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
RIMA	*	565	569	595								
MAS MERAH	610	*	603	*								
MINAH	522	530	539	534								
SEPUTIH	762	762	772	774								
PANJANG	572	566	569	550								
ARA	614	615	623	627								

\*Inside the 10 acres enclosure

**Table 4: Minah's Weekly Body Weight (Kg), April 2003**

Rhino ID / Date	2/4	9/4	17/4	23/4	30/4
Minah	530	529	530	534	532

**Table 1: Blood Collection from the Rhinos, April 2003**

<b>Date</b>	<b>Rhino ID</b>	<b>Area taken</b>	<b>Remarks</b>
Apr 2	Mas Merah Rima Minah Panjang	Tail Tail Tail Tail	Samples were taken from the females for P4 analysis.
Apr 7	Panjang Mas Merah Rima	Tail Tail Tail	Samples were taken from the females for P4 analysis.
Apr 10	Rima Minah Panjang Seputeh Mas Merah	Tail Tail Tail Tail Tail	Blood was taken for P4 analysis
Apr 14	Minah Panjang Mas Merah Seputeh	Tail Tail Tail Tail	Samples were taken from all females for P4 analysis.
Apr 18	Mas Merah Minah Seputeh Panjang	Tail Tail Tail Tail	Samples were taken from the females for P4 analysis.
Apr 21	Minah Panjang Mas Merah Seputeh	Tail Tail Tail Tail	Samples were taken from the females for P4 analysis.
Apr 24	Minah Seputeh Panjang Mas Merah	Tail Tail Tail Tail	Blood was taken for the P4 analysis
Apr 28	Panjang Minah Mas Merah Seputeh	Tail Tail Tail Tail	Samples were taken from the females for P4 analysis
Apr 30	Panjang Minah	Tail Tail	Samples were taken from the females for P4 analysis

**Table 2: Observation on the Rhinos During Introduction, March 2003**

<b>Date</b>	<b>Rhino ID</b>	<b>Observation</b>
Apr 1	Minah & Ara	Ara checked Minah but she turned & head butting a lot.
	Panjang & Ara	No interest observed & Panjang vocalizing a lot
	Seputeh & Ara	Seputeh pushed Ara too much and wanted to fight.
Apr 2	Rima & Ara	Rima wanted to fight with Ara
Apr 3	Panjang & Ara	Ara checked Panjang but she walked away, vocalizing & blowing.
	Minah & Ara	No interest observed between the two rhinos.
	Seputeh & Ara	Head butting a lot & Seputeh wanted to fight.
Apr 4	Panjang & Ara	No interest observed.
	Minah & Ara	Head butting a lot.
	Rima & Ara	No interest, she wanted to fight.
	Seputeh & Ara	No interest, head butting a lot.
Apr 5	Minah & Ara	Not much interest.
	Rima & Ara	Ara checked Rima but she turned around and wanted to fight.
Apr 6	Minah & Ara	Not much interest.
	Rima & Ara	Rima wanted to fight, no interest observed.
Apr 7	Seputeh & Ara	Ara checked & followed her for a while but Seputeh turned and wanted to fight. Head butting too much.
	Panjang & Ara	No interest observed.
Apr 8	Rima & Ara	Rima wanted to fight with Ara.

Date	Rhino ID	Observation
Apr 9	Minah & Ara	No interest observed between the two rhinos.
	Panjang & Ara	No interest observed.
	Rima & Ara	Good behaviour observed, Ara mounted Rima but she walked away.
	Seputeh & Ara	Ara checked Seputeh, followed her for a while and then lost interest.
Apr 10	Seputeh & Ara	Ara mounted twice but Seputeh walked away, head butting occurred.
	Rima & Ara	Ara mounted twice but Rima kicking and did not stand properly.
Apr 11	Seputeh & Ara	Ara followed for a while then mounted with partial erection but Seputeh walked away. Head butting occurred.
	Rima & Ara	Ara mounted five times & the last one with full erection but Rima walked away and Ara chased her. Separated.
Apr 12	Rima & Ara	Ara mounted twice and the last resulting intromission, which lasted for 51 minutes.
Apr 20	Minah & Ara	Not much interest. Head butting too much.
Apr 21	Minah & Ara	Not much interest. Head butting too much
Apr 22	Minah & Ara	AM & PM: Not much interest. Head butting too much
Apr 23	Minah & Ara	AM & PM: Ara checked Minah & followed for a while. Head butting a lot & Ara chased Minah.
Apr 24	Minah & Ara	The rhinos were left together for 20 minutes but not much interest observed. They looked like playing together with too much head butting.
Apr 25	Minah & Ara	No interest for the first 10 minutes, then Ara approached Minah and followed for a while but Minah turned around, head butting occurred & Ara chased Minah.
Apr 26	Minah & Ara	AM/PM: Head butting a lot, occasionally Ara lying down & Minah pushed him too much, Ara chased her.
Apr 27	Minah & Ara	Ara checked Minah but ignored her when she walked away.
Apr 28	Minah & Ara	No interest observed. Ara checked Minah but ignored her when she walked away.

Summary - Sumatran Rhino Reproductive Examination, April 2003

Exam Date	Female ID	P4 (ng/ml)	Ultrasound Data	Behaviour
Apr 1	Mas Merah		R: MSF L: 12mm	No mixing
	Panjang		R: MSF (<10mm). L: 14mm	Vocalized a lot, no interest
Apr 2	Minah		R: 12-13mm L: 17mm (regressing follicle)	No mixing
	Rima		R: MSF L: 14-15mm	Rima wanted to fight with Ara.
Apr 3	Seputeh		Not examine, Seputeh did not cooperate.	Head butting a lot & Seputeh wanted to fight.
Apr 7	Rima		R: MSF L: 15mm & 13mm	No mixing
	Minah		R: MSF L: 17mm	No mixing
Apr 10	Rima		R: MSF L: 18mm, 13mm	Ara mounted twice but Rima kicking and walked away.
	Panjang		R: MSF L: 14mm	No mixing
Apr 11	Minah		R: 12mm L: 16mm (regressing)	No mixing
	Seputeh		Managed to do some palpation but she did not stand for the procedure	Ara followed Seputeh for a while & tried to mount. Head butting a lot.
Apr 12	Rima		R: 12mm L: 20mm, 13mm	Ara followed Rima and mounted her 3 times and the last with successful intomission, which lasted 51 minutes.



Exam Date	Female ID	P4 (ng/ml)	Ultrasound Data	Behaviour
Apr 15	Minah		R: 14mm L: 14mm (regressing)	No mixing
Apr 18	Minah		R: 15-16mm L: 13mm	No mixing
Apr 21	Minah		R: 18mm L: MSF	Head butting too much.
Apr 22	Panjang		R: MSF L: 14-15mm	No mixing
Apr 23	Minah		R: 20mm L: MSF	AM:Ara checked then followed Minah but she turned back & head butting a lot. Ara lying down & Minah pushed him. Ara chased Minah, separated. PM: No interest observed.
Apr 25	Minah		R: 22mm L: MSF	AM:No interest during the first 10 minutes, then Ara sniffed & followed Minah for a while. Minah turned back & head butting too much. Ara chased Minah. PM: Ara checked Minah but she turned around and head butting too much.
Apr 26	Minah		R: 22mm L: MSF	AM:Ara followed Minah for a while, she turned around and head butting occurred. Ara lying down, Minah pushed him, Ara chased Minah away. PM: Ara followed Minah but head butting too much
Apr 28	Minah		R: 24mm L:10-12mm	Ara checked Minah but ignored her when she walked away.

**The Breeding Dates of Rhinos in Sg. Dusun, 2000 – 2003.**

<b>Date(s)</b>	<b>Rhinos</b>	<b>Remarks</b>
5/10/00	Rima & Ara	Bred for 46 minutes.
14/10/00	Panjang & Ara	Bred for about 35 minutes.
19/10/00	Seputeh & Ara	35 minutes.
29/10/00	Rima & Ara	Rima was bred for about 35 minutes.
8/11/00	Seputeh & Ara	Intromission was observed and lasted about 23 minutes.
9/11/00	Seputeh & Ara	Seputeh was bred for about 30 minutes.
10/01/01	Rima & Ara	Bred for 20 minutes after assisted intromission.
26/01/01	Seputeh & Ara	Bred for 30 minutes in the afternoon.
31/01/01	Rima & Ara	Bred for 20 minutes.
01/02/01	Rima & Ara	Bred for 32 minutes.
16/02/01	Seputeh & Ara	Bred for 29 minutes.
17/02/01	Seputeh & Ara	Bred for 35 minutes.
22/02/01	Rima & Ara	Bred for 55 minutes.
15/03/01	Rima & Ara	Bred for 14 & 5 minutes.
16/03/01	Rima & Ara	Bred for 10, 5 & 13 minutes.
08/04/01	Seputeh & Ara	Bred for 32 minutes.
11/04/01	Rima & Ara	Bred for 25 minutes.
03/05/01	Rima & Ara	Bred for 36 minutes.
25/05/01	Rima & Ara	Bred for 25 minutes.
31/05/01	Panjang & Ara	Bred for 26 minutes.
08/06/01	Seputeh & Ara	Bred for 13 & 19 minutes.
16/06/01	Rima & Ara	Bred for 35 minutes.
17/06/01	Rima & Ara	Bred for 30 minutes.
30/06/01	Seputeh & Ara	35 minutes
21/07/01	Seputeh & Ara	30 minutes
22/07/01	Seputeh & Ara	23 minutes
23/07/01	Seputeh & Ara	30 minutes
30/07/01	Rima & Ara	35 minutes
13/08/01	Seputeh & Ara	30 minutes
29/08/01	Mas Merah & Ara	2 minutes
03/09/01	Seputeh & Ara	27 minutes
04/09/01	Seputeh & Ara	15 mins, 32 minutes
25/09/01	Seputeh & Ara	43 minutes
26/09/01	Seputeh & Ara	34 minutes
17/10/01	Seputeh & Ara	30 minutes
18/10/01	Seputeh & Ara	30 minutes
23/10/01	Rima & Ara	30 minutes
08/11/01	Seputeh & Ara	55 minutes
13/11/01	Rima & Ara	20 mins, 20 minutes
24/11/01	Mas Merah & Ara	20 minutes

<b>Date(s)</b>	<b>Rhinos</b>	<b>Remarks</b>
18/01/02	Mas Merah x Ara	Bred for 35 minutes
04/04/02	Seputeh x Ara	Bred for 40 minutes
26/04/02	Seputeh x Ara	Bred for 15 & 35 minutes
17/05/02	Seputeh x Ara	Bred for 25 minutes
06/07/02	Seputeh x Ara	Bred for 25 minutes
29/09/02	Seputeh x Ara	Bred for 16 minutes
19/10/02	Seputeh x Ara	Bred for 15 minutes
20/10/02	Seputeh x Ara	Bred for 23 minutes
22/10/02	Rima x Ara	Bred for 28 minutes
10/11/02	Seputeh x Ara	Bred for 30 minutes
04/12/02	Seputeh x Ara	Bred for 52 minutes
17/12/02	Rima x Ara	Bred for 7 & 15 minutes
20/01/03	Rima x Ara	Bred for 25 minutes
21/01/03	Rima x Ara	Bred for 17 minutes
04/02/03	Seputeh x Ara	Bred for 10 minutes
05/02/03	Seputeh x Ara	Bred for 52 minutes
23/02/03	Rima x Ara	Bred for 19 minutes
12/04/03	Rima x Ara	Bred for 51 minutes

**Panjang FSH / PGF Hormonal Therapy**

<b>Date</b>	<b>FSH / HR Post - FSH</b>	<b>Ultrasound Data</b>	<b>Behaviour</b>
April 28 9.00 am 8.45 pm	40mg FSH + 15mg PGF IM 40mg FSH IM	R: NSF L: MSF (10-12mm)	No mixing
April 29 8.30 am 8.15 pm	30mg FSH + 15mg PGF IM 30mg FSH IM		No mixing
April 30 8.15 am 8.00 pm	20mg FSH IM 20mg FSH IM		No mixing
May 1 8.05 am 8.00 pm	10mg FSH IM 10mg FSH IM	R: MSF L: 15mm, 14mm, 14mm	Ara checked Panjang & followed her for a while but Panjang vocalized a lot.
May 2	96 Hrs Post - FSH	R: MSF L: 17mm, 15mm, 14mm	Ara sniffed Panjang but ignored her when she walked away. Ara approached Panjang again but she blowing and vocalized a lot.
May 3	120 Hrs Post - FSH	R: MSF L: 19mm, 16mm, 14mm	AM: Ara checked Panjang, then followed her and tried to mount but Panjang walked away from Ara. PM: No interest
May 4	144 Hrs Post - FSH	R: MSF L: 20mm, 17mm, 15mm	AM: Ara sniffed Panjang & followed her for a while but Panjang vocalized a lot & wanted to fight. PM: No interest. Both rhinos went separate ways, Panjang blowing & vocalized when Ara approached.

Date	FSH / HR Post - FSH	Ultrasound Data	Behaviour
May 5	7 days Post – FSH	R: NE L: 21mm, 17mm	AM: Ara checked Panjang, no interest observed. Ara kept eating when Panjang walked away. PM: No interest observed.
May 6	8 days Post – FSH	R: 12mm L: 21mm, 17mm	AM: Ara followed Panjang closely & tried to mount but Panjang sit & then walked away under him. Panjang vocalizing & blowing a lot. PM: Panjang vocalized & blowing a lot when Ara approached her and she looked afraid.
May 7	9 days Post – FSH	R: MSF L: 20mm, 15mm	AM: Ara followed Panjang for a while, Panjang vocalized frequently & then both rhinos went separate ways. Ara approached Panjang again but she blowing and vocalizing. PM: Ara checked Panjang but ignored her when she walked away.
May 8	10 days Post – FSH	R: MSF L: 20mm, 15mm	AM: Ara sniffed Panjang and followed her for a while, then lost interest. Ara approached Panjang again but she blowing & vocalizing. PM: Ara followed Panjang but then lost interest. both rhinos went separate ways.

Date	FSH / HR Post - FSH	Ultrasound Data	Behaviour
May 9	11 days Post - FSH	NE, no electricity	AM: Ara sniffed Panjang but ignored her when she walked away. Both rhinos went separate ways.
May 10	12 days Post - FSH	R: 12mm L: 18mm, 13mm (regressing)	AM: No interest observed. Ara checked Panjang but ignored her when she walked away.
May 11	13 days Post - FSH	Not examine (NE)	AM: Ara checked Panjang but ignored her when she walked away. No interest observed.

UNIVERSITY VETERINARY HOSPITAL  
 (HOSPITAL VETERINAR UNIVERSITI)  
 Large Animal Practice  
 Theriogenology and Cytogenetic Unit : 03-8946 8254

RIA DATA REDUCTION USING LOGIT-LOG TR/  
 (Computer Generated)

Date : 12-May-03 Assay #: P11/2003  
 Hormone : Progesterone Expt : Dr. Aidi/Dr. Rosa/Dr. VJ QC-L=  
 Label : 125-I TC (cpm)= 55040 QC-M=  
 Sample : S. Rhino / A. Elephant B0 (cpm)= 28085 QC-H=  
 Sg. Dusun/Sepilok/ZN NSB (cpm)= 440

Tube#	Sample	CPM	%B	Logit	LOG conc
1	TC	55040.0			
2	TC	55040.0			
3	NSB	440.0			
4	NSB	440.0			
5	B0	27927.0			
6	B0	28205.0			
7	B0	28002.0			
8	B0	28205.0			
9	0.1	25398.0	88.9	2.0772	-1.0000
10	0.1	25398.0	88.9	2.0772	-1.0000
11	0.5	20169.0	70.2	0.8591	-0.3010
12	0.5	20169.0	70.2	0.8591	-0.3010
13	2	13900.0	47.9	-0.0830	0.3010
14	2	13900.0	47.9	-0.0830	0.3010
15	10	6780.0	22.6	-1.2325	1.0000
16	10	6780.0	22.6	-1.2325	1.0000
17	20	4631.0	14.9	-1.7407	1.3010
18	20	4631.0	14.9	-1.7407	1.3010
19	40	3212.0	9.9	-2.2117	1.6021
20	40	3212.0	9.9	-2.2117	1.6021

Tube#	Sample	CPM	%B	Logit	LOG conc	ng/ml
	Sensitivity			99.1	4.7277	0.00
	20%			20.0	-1.3863	12.33
	50%			50.0	0.0000	1.77
	80%			80.0	1.3863	0.25
21	QC-L	Nil				
22		Nil				
23	QC-M	11141.0	38.1	-0.4852	0.5426	3.49
24		11024.0	37.7	-0.5029	0.5534	3.58
25	QC-H	7413.0	24.8	-1.1078	0.9215	8.35
26		7395.0	24.8	-1.1112	0.9236	8.39
27	18/04/03 - Mas Merah	24315.0	85.0	1.7354	-0.8088	0.16
28	23/04/03	23534.0	82.2	1.5320	-0.6850	0.21
29	28/04/03	22619.0	79.0	1.3232	-0.5579	0.28
30	01/05/03	24567.0	85.9	1.8077	-0.8527	0.14

31	08/05/03	24548.0	85.8	1.8021	-0.8493	0.14
32	14/04/03 - Minah	24811.0	86.8	1.8814	-0.8976	0.13
33	18/04/03	25142.0	88.0	1.9882	-0.9626	0.11
34	21/04/03	24950.0	87.3	1.9252	-0.9242	0.12
35	23/04/03	24358.0	85.2	1.7475	-0.8161	0.15
36	28/04/03	23144.0	80.8	1.4397	-0.6288	0.24
37	30/04/03	21454.0	74.8	1.0892	-0.4155	0.38
38	01/05/03	22750.0	79.4	1.3515	-0.5751	0.27
39	08/05/03	22525.0	78.6	1.3032	-0.5457	0.28
40	14/04/03 - Panjang	23544.0	82.3	1.5344	-0.6864	0.21
41	18/04/03	23677.0	82.7	1.5672	-0.7064	0.20
42	21/04/03	24199.0	84.6	1.7034	-0.7893	0.16
43	23/04/03	23019.0	80.4	1.4112	-0.6115	0.24
44	28/04/03	22207.0	77.5	1.2370	-0.5055	0.31
45	30/04/03	19420.0	67.6	0.7346	-0.1997	0.63
46	01/05/03	24865.0	87.0	1.8982	-0.9078	0.12
47	08/05/03	24756.0	86.6	1.8644	-0.8872	0.13
48	14/04/03 - Seputeh	26026.0	91.1	2.3263	-1.1683	0.07
49	18/04/03	24061.0	84.1	1.6661	-0.7666	0.17
50	21/04/03	25574.0	89.5	2.1422	-1.0563	0.09

UVH, Faculty of Veterinary Medicine, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor DE

Fax: 03-8948 6722 Website: <http://vet.upm.edu.my/UVH/>

::

Assay #: P11/2003

'Tube#	Sample	CPM	%B	Logit	Log conc.	ng/ml
51	23/04/03 - Seputeh	25817.0	90.4	2.2377	-1.1144	0.08
51	28/04/03	23640.0	82.6	1.5580	-0.7008	0.20
52	30/04/03	25573.0	89.5	2.1418	-1.0561	0.09
53	01/05/03	25173.0	88.1	1.9987	-0.9690	0.11
54	08/05/03	23454.0	81.9	1.5126	-0.6732	0.21
55	04/11/02 - Gelugob	23528.0	82.2	1.5305	-0.6841	0.21
56	27/11/02	13412.0	46.2	-0.1527	0.3403	2.19
57	02/12/02	22850.0	79.8	1.3735	-0.5885	0.26
58	12/12/02	22765.0	79.5	1.3548	-0.5771	0.26
59	17/12/02	20784.0	72.4	0.9663	-0.3407	0.46
60	09/01/03	20647.0	72.0	0.9420	-0.3259	0.47
61	16/01/03	19094.0	66.4	0.6821	-0.1677	0.68
62	23/01/03	19547.0	68.0	0.7553	-0.2123	0.61
63	30/01/03	20036.0	69.8	0.8366	-0.2618	0.55
64	02/02/03	21491.0	75.0	1.0962	-0.4198	0.38
65	19/03/03	23255.0	81.2	1.4654	-0.6445	0.23
66	26/03/03	24994.0	87.4	1.9394	-0.9329	0.12
67	29/03/03	25652.0	89.8	2.1721	-1.0745	0.08
68	02/04/03	25215.0	88.2	2.0130	-0.9777	0.11
69	06/04/03	27848.0	97.6	3.7013	-2.0051	0.01
70	07/02/03 - Sibol	27749.0	97.2	3.5611	-1.9198	0.01
71	14/02/03	26750.0	93.7	2.6963	-1.3935	0.04
72	21/02/03	24893.0	87.1	1.9070	-0.9132	0.12
73	07/03/03	25689.0	89.9	2.1865	-1.0833	0.08



74	14/03/03	22894.0	80.0	1.3832	-0.5944	0.25
75	21/03/03	23083.0	80.6	1.4258	-0.6203	0.24
76	30/03/03	21359.0	74.5	1.0713	-0.4046	0.39
77	04/04/03	20127.0	70.1	0.8520	-0.2711	0.54
78	11/04/03	19493.0	67.8	0.7465	-0.2069	0.62
79	07/02/03 - Siti	27734.0	97.2	3.5414	-1.9078	0.01
80	14/02/03	27624.0	96.8	3.4072	-1.8261	0.01
81	21/02/03	20931.0	73.0	0.9927	-0.3567	0.44
82	07/03/03	18237.0	63.4	0.5481	-0.0862	0.82
83	14/03/03	18718.0	65.1	0.6226	-0.1315	0.74
84	21/03/03	20461.0	71.3	0.9094	-0.3061	0.49
85	30/03/03	23175.0	81.0	1.4469	-0.6331	0.23
86	04/04/03	21921.0	76.5	1.1795	-0.4705	0.34
87	11/04/03	24253.0	84.8	1.7182	-0.7983	0.16
88	QC-L	Nil				
89		Nil				
90	QC-M	10861.0	37.1	-0.5277	0.5685	3.70
91		10990.0	37.6	-0.5081	0.5566	3.60
92	QC-H	7665.0	25.7	-1.0603	0.8926	7.81
93		7465.0	25.0	-1.0979	0.9155	8.23

TRANSFORMATION

ng/ml	cv		
Nil		UBo%=	51.0
3.59	1.7	NSB%=	0.8
8.19	2.1	CBo%=	50.2

Mean 0 = 28084.8  
cv % = 0.4  
SD = 123.1

Regression Output: X on Y

Constant	0.2473626
Std Err of Y Est	0.014545
R Squared	0.99979
No. of Observations	12
Degrees of Freedom	10

  

X Coefficient(s)	-0.60857
Std Err of Coef.	0.00279

mean	cv
------	----

3.53	1.24
8.37	0.24

---

Jan 2002

FPV/UVH/B404  
Muka surat: 2/2

---

mean

cv

---

Insufficient sample -  $25 \text{ ul} > 4 \times 0.01 = 0.04 \text{ ng/ml}$

3.65	1.38
8.02	2.63