



ORANGUTAN CONSERVANCY

ORANGUTAN VETERINARY ADVISORY GROUP WORKSHOP 2012 REPORT





Photos provided by Steve Unwin, Raffaella Commitante, and Workshop Participants

Orangutan Conservancy Veterinary Workshop logo courtesy Amy Burgess

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Prepared with participants of the Orangutan Conservancy 2012, Orangutan Veterinary Advisory Group (OVAG) Workshop, Kula Lampur, Malaysia July 9 – 13, 2012

R. Commitante, S. Unwin (Editors). Orangutan Conservancy (OC). 2012.

Orangutan Conservancy 2012 Orangutan Veterinary Advisory Group Workshop Report.

Additional copies of the *Orangutan Conservancy 2012 Veterinary Advisory Group Workshop Report* and previous years' reports can be ordered through the Orangutan Conservancy, P.O. Box 513, 5001 Wilshire Blvd., #112, Los Angeles, California, 90036, USA., or go to our website at www.orangutan.com.



Orangutan Conservancy 2012 Orangutan Veterinary Advisory Group (OVAG) Workshop

July 9 – 3 2012

Universiti Putra Malaysia, Kuala Lumpur, Malaysia

Participating Organizations:

Orangutan Conservancy, United States
Chester Zoo / NEZS, United Kingdom
Putra University, Kuala Lumpur, Malaysia
Liverpool School of Tropical Medicine, United Kingdom
Murdoch University, Perth, Western Australia
Sumatran Orangutan Conservation Programme (SOCP), Medan, Indonesia
Borneo Orangutan Survival Foundation, Nyaru Menteng, Palangkaraya, Kalimantan, Indonesia
Borneo Orangutan Survival Foundation, Samboja Lestari, Samboja, Kalimantan, Indonesia
Orangutan Foundation International (OFI), Kalimantan, Indonesia
Orangutan Foundation United Kingdom (OFUK), Kalimantan, Indonesia
Gadjah Mada University, Jogjakarta, Indonesia
International Wildlife Rescue, Indonesia (GPOCP)
ABAXIS Europe, Germany
Jogja Orang Utan Center, Jogjakarta, Indonesia
Frankfurt Zoological Society/Jambi SOCP Orangutan Release Site, Sumatra, Indonesia
IVMA (Indonesian Veterinarians Association)
A'Famosa Animal World Safari
Sabah Wildlife Department
Hutan KOCP (Kinabatangan Orangutan Conservation Program)
Pingtung Rescue Center, Taiwan
Zoo Negara, Kuala Lumpur, Malaysia
Bukit Merah Orangutan Sanctuary, Malaysia
Sabah Wildlife Department – Sepilok, Malaysia
A'Famosa Animal World Safari, Malaysia
Animal Medical Center, Malaysia

Supporting Organizations:

Orangutan Conservancy, United States
Chester Zoo/ NEZS, United Kingdom
Putra University, Kuala Lumpur, Malaysia
Ministry of Natural Resources and Environment, Malaysia
ABAXIS Europe, Germany
Liverpool School of Tropical Medicine, United Kingdom

Hosted by:

**Universiti Putra Malaysia, Faculty of Veterinary Medicine,
Kuala Lumpur, Malaysia**





Orangutan Conservancy 2012 Orangutan Veterinary Advisory Group (OVAG) Workshop

2012 OVAG REPORT

TABLE OF CONTENTS

Section 1

Executive Summary

Budget

Section 2

Letter of Invitation

Agenda

Participants Contact List

Section 3

Proceedings

Section 4

Miscellaneous Notes

Section 5

Attachments



Orangutan Conservancy 2012 Orangutan Veterinary Advisory Group (OVAG) Workshop

2012 OVAG REPORT

July 9 – 13, 2012



Section 1

Executive Summary

The Orangutan Conservancy continues to promote collaboration and training between veterinarians and staff working with orangutans in Indonesia, Malaysia and the international community. As has been stated previously, veterinarians and staff *in situ* collectively care for the largest captive population of orangutans in the world. They continue to face difficult challenges, and continue to find themselves short of medicine, equipment, money, space, support staff and time.

The dedicated men and women working toward orangutan conservation do not lack for skill; or commitment. And that is why the Orangutan Conservancy is committed to continuing to stage the Orangutan Conservancy /Orangutan Veterinary Advisory Group (OC/OVAG) Workshops. In 2012, the annual workshop was held from July 9 - 13 in Kuala Lumpur, Malaysia. The workshop series, which was inaugurated in 2009 in Borneo, gathered together the veterinary teams that work on the frontlines of the orangutan conservation crisis, and gave them a rare opportunity to hone skills, discuss issues and ideas, and renew friendships that could someday mean the difference between life and death for endangered apes in Southeast Asia.

Orangutans are in severe crisis. The largest of the great apes found in Asia, their natural range is limited to the islands of Borneo and Sumatra, and their rainforest homes are continuing to disappear at alarming rates. More than 80 percent of the orangutans' habitat has been destroyed over the last 20 years, and new estimates show that approximately only **40,000** orangutans are thought to exist. At the current rate of decline, experts believe that orangutans may become extinct in the wild within 25 years!

The primary threats to orangutans are the conversion of rainforests to oil palm plantations, continued logging and habitat destruction, human encroachment, and the pet trade. As a result of such intense pressures, an extremely large number of orphaned orangutans exist in rehabilitation centers across Borneo and Sumatra. These orangutans – which number approximately 1,600 – arrive bearing a host of physical and emotional wounds, and require intense veterinary care to recover. As these orangutans make their way towards release (if possible), veterinarians in the field are under more pressure than ever to ensure that the orangutans in their care have the best possible changes for survival and are free of disease.

The orangutans that are judged fit to return to the wild will be reintroduced after a long, complex process, but an overwhelming majority will continue to reside in the rehabilitation centers.

The 2012 OC /OVAG Workshop focused on the issues relating to orangutan releases, continuing aspects of captive orangutan care, focusing on cardiac care, parasites, surgery, welfare issues and nutrition.

The 2012 OC /OVAG Workshop was sponsored by the Orangutan Conservancy, the Chester Zoo, a very generous major donation from both the University Putra Malaysia and the Ministry of Natural Resources and Environment Malaysia and Abaxis (Europe).

The OC 2012 Orangutan Veterinary Advisory Group Workshop included **44** participants from the orangutan rescue and rehabilitation centers in Indonesia and Malaysia, along with experts, facilitators, and veterinary volunteers and workers from the United States, the United Kingdom, Indonesia, Malaysia, Australia, Germany and Taiwan. The OC 2012 Orangutan Veterinary Advisory Group Workshop was designed and facilitated by Dr. Steve Unwin of the Chester Zoo, in partnership with Dr. Raffaella Commitante of OC, the same team that helped create the format from its inception in 2009.

In addition to presentations, practical demonstrations and roundtable discussions, the delegates made site visits to Zoo Negara, Malaysia, as well as visiting several well-known local attractions in Kuala Lumpur and a side trip was made by Steve Unwin, Raffaella Commitante, Popowati and Wendy Pramaswari to the Hutan KOCP and Sepilok in Sabah.

The focus of the OC 2012 Veterinary Workshop, however, remained the practical sessions, presentations, roundtables, and break-out groups that make the workshop so valuable. There, veterinarians who often work alone under extreme duress got a chance to pose questions and tackle hypothetical scenarios that might otherwise get overlooked. They also continue to establish and build friendships and alliances that strengthen the orangutan conservation community as a whole. These friendships and alliances are carried over through the entire year. Participants stay in touch and contact each other frequently regarding issues they share as well as contacting outside experts who have now become their friends.

As with the past four workshops, the OVAG continued to tackle tough issues, such as euthanasia, laboratory politics, the veterinary aspects of eco-tourism, field diagnostics and surgeries, and fundamentals of environmental enrichment, disease case studies and tuberculosis testing. In this way, the OC Veterinary Workshops continue to help build a community of veterinary healthcare experts that stands strongest when it stands together.





Orangutan Conservancy 2012 Orangutan Veterinary Advisory Group (OVAG) Workshop

2012 OVAG REPORT

July 9 – 13, 2012

Workshop Budget

ITEM	UNIT COST	TOTAL
Airfare (International)	\$ 2,000 x 4	\$8,000
Airfare (Domestic)	\$ 400 x 30	\$12,000
Accommodation - Malaysia	\$ 80 x 38 x 6 nights	\$18,240
Ground Transportation	\$ 700	\$700
Printing	\$ 400	\$400
TOTAL		\$39,340



Orangutan Conservancy 2012 Orangutan Veterinary Advisory Group (OVAG) Workshop

2012 OVAG REPORT

July 9 – 13, 2012



Section 2

Official 2012 Letter of Invitation



April 16, 2012

Honorary Patrons:
Dr. Jane Goodall
Dr. Edward O. Wilson
Dr. Suwanna Gauntlett
Djamaludin
Suryohadikusumo

Advisers:
Dr. Tim Laman
Dr. Mark Leighton
Dr. Amory B. Lovins
Dr. Cheryl Knott
Lori Perkins
Dr. Herman Rijkse
Dr. Anne Russon
Dr. Robert Shumaker
Dr. Willie Smits
Dr. Carel Van Schaik

Directors
Norm Rosen, Chair
Dr. Anne Russon
Dr. Rob Shumaker
Dr. Raffaella Commitante
Barbara Shaw
Juanita Kemp
Linda Keenan

**Director of Marketing
/ Development**
Thomas Mills

**RE: Orangutan Conservancy Orangutan Veterinary Advisory Group Workshop
2012
Orangutan Conservancy Lokakarya Komunitas Dokter Herwan
Orangutan 2012**

To Whom It May Concern:

This letter shall serve as an invitation to attend the Orangutan Conservancy Orangutan Veterinary Advisory Group Workshop 2012 sponsored by the Orangutan Conservancy (OC), a United States not-for-profit organization and its Orangutan Crisis Coalition (OCC), with co-sponsorship from Chester Zoo (a zoological park in The United Kingdom) and co-organized by Center of Excellence for Wildlife Research and Conservation, Universiti Putra Malaysia. The workshop will be held at Faculty of Veterinary Medicine, Universiti Putra Malaysia.

Contact information for Malaysia: Reuben Sharma +60173247671, email: rsksharma@hotmail.com. Contact information for OC/OVAG: (Raffaella Commitante) email: rcommitante@gmail.com. Contact information for Chester Zoo: Steve Unwin email: Steve.unwin@chesterzoo.org.

This, our fourth workshop, will continue to bring together experts working closely with orangutans in Indonesia and Malaysia and in the international community to allow for the sharing of information and expertise, and the creation of long lasting friendships and contacts. It will be held:

July 9 – July 13, 2012
(arrival on the 8th and departure on the 14th)

OC would like to extend an invitation to the person/s listed below to attend this important workshop.

Steve Unwin

We thank you for your participation in allowing your staff to attend.

Travel expenses for the workshop and accommodation will be paid for by Chester Zoo during the length of the workshop. Accommodation information will be sent directly to participant.

Respectfully,

A handwritten signature in black ink, appearing to read "Raffaella Commitante".

Raffaella Commitante, PhD
Director, Orangutan Conservancy

**Orangutan Conservancy / P.O. Box 513 / 5001 Wilshire Blvd. / #112
Los Angeles, CA 90036/USA / www.orangutan.com / info@orangutan.com**



Orangutan Conservancy 2012 Orangutan Veterinary Advisory Group (OVAG) Workshop

2012 OVAG REPORT

July 9 – 13, 2012

AGENDA

Sunday, July 8

Delegate arrival

Monday, July 9 – At Hotel

- | | |
|-------|---|
| 08:00 | Welcome to Delegates (Steve Unwin, Raffaella Commitante)
Group Activity – meet and greet
Evaluation Session |
| 09:00 | Orangutan Releases (from center veterinarian perspective)-BOS/SOCP/SWD/BM |
| 10:30 | Coffee Break/casual discussions |
| 11:00 | Outbreak Response / IUCN Diseases Risk Analysis Tool Kit- Steve Unwin |
| 12:00 | Studying Wild Orangutans - KOCP |
| 13:00 | Lunch/casual discussions |
| 14:00 | Disease Surveillance Protocols – Steve Unwin and Reuben Sharma |
| 15:00 | TB Overview Report – Steve Unwin
TST in Orangutans – Rosalie NM |
| 16:00 | Coffee Break/casual discussions |
| 16:30 | Evaluating Stress in Orangutans – Raffaella Commitante |
| 17:30 | Group Wrap-Up Session – Disease Outbreak Contingency Planning :
Wild and Released Orangutans |

19:30 Dinner/Ice Breaker

Tuesday, July 10 – At University Putra Malaysia, Veterinary Faculty

08:00 Official Opening Day Ceremony/Press Conference – Minister of Natural Resources and Environment, University Putra Malaysia Officials

10:30 Coffee break/casual discussions

11:00 Tour of Veterinary Buildings

12:00 Review of Nutrition – Steve Unwin and delegates

13:00 Lunch – casual discussions

14:00 Case Studies:
Bone Surgery – Yenny SOCP
Health Screenings – Agus NM
Pre-Release Area Protocols – Agus NM
Diet and enrichment – Winny SOCP

16:00 Coffee break/casual discussions

16:30 Respiratory Diseases and Neonatal Care – Dr Sabapathy BM

19:30 Special Cultural Event - Conference Dinner

Wednesday, July 11- At University

08:30 Primates parasites in Southeast Asia – Reuben Sharma

09:30 Parasite Practical and Diagnostics: Blood Samples – Wendi Bailey, Reuben Sharma and Steve Unwin

10:30 Coffee Break/casual discussions

11:00 Parasite Practical and Diagnostics: Fecal Samples – Wendi Bailey, Reuben Sharma and Steve Unwin

13:00 Lunch/casual discussions

14:00 Assessment Excursion to National Zoo
Group Photo

Thursday, July 12 – At University

08:30 Surgery/Cardiology/Ultrasound Techniques in Great Apes – Steve Unwin and Sivan (UPM)

10:00 Orthopedic Surgery Theory– Loqman (UPM)

10:30 Coffee Break/casual discussions

11:00 Orthopedic Surgery Practical– Loqman (UPM)

13:00	Lunch/casual discussions
14:00	Post Mortem Techniques – Steve Unwin and UPM Staff
16:00	Coffee Break/casual discussions
16:30	Group Discussion: Release and Wild Population Disease Outbreaks

Friday, July 12 – At Hotel

08:00	Welfare: Behavior, Enrichment, Welfare Assessment Protocols –Sumita
10:30	Coffee break/casual discussions
11:00	Group Discussion – Welfare
11:30	Evaluation Session
12:30	Friday Prayer Time and Lunch
15:00	Case Studies: General Issues – IAR Helminth Testing – NM
16:00	Coffee Break/casual discussions/3 words
16:30	Wrap-Up Sessions – Quiz Results and Review PASA update
19:30	Closing Dinner / Presentation of Certificates



Orangutan Conservancy 2012 Orangutan Veterinary Advisory Group (OVAG) Workshop

2012 OVAG REPORT

July 9 – 13, 2012

Participant Contact List

1	Adi Irawan	International Animal Rescue (IAR/KalTim)	adi@internationalanimalrescue.org
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4	Ardiansyah Suhaery	IVMA (Indonesian Vet Associationj)	zulfiarsan@yahoo.com
5	Atina Unwin	Independent Vet Nurse	
6	Chandrasegaram Sethupathy	A'Famosa Animal World Safari	
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10	Diana Ramirez	Sabah Wildlife Department	
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21	Muhammad Danial Felix Abdullah	Zoo Negara	
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28	Sabapathy D.	Bukit Merah Orangutan Sanctuary	
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31	Sivan Ayahsamy	Animal Medical Center	
32	Steve Unwin	Chester Zoo	Steve.unwin@chesterzoo.org
33	Sumita Sugnaseelan	Universiti Putra Malaysia	sseelan@yahoo.com
34	Symphorosa Sipangkui	Sepilok (Sabah Wildlife Department)	
35	Tengku Rinalfi Putra Tengku Azizan	Universiti Putra Malaysia	
36	Tri Wahyu Pangestiniingsih	Universiti Gajah Mada	
37	Vishwanee Kolandaiveloo	Universiti Putra Malaysia	
38	Wendi Bailey	Liverpool School of Tropical Medicine	jwbailey@liverpool.ac.uk
39	Wendi Prameswari	International Animal Rescue (IAR/KalTim)	Wendi.prameswari@gmail.com
40	Winny Pramesywari	Jambi Release Site - SOCP	win.pramesywari@gmail.com
41	Wong Siew Yie	A'Famosa Animal World Safari	
42	Yenny Saraswati Jaya	Sumatran Orangutan Conservation Program	yenny.jaya@gmail.com.
43	Zulfiqri Fiqri	Orangutan Foundation	fikrizein97@yahoo.com
44	Amwan Siva	Animal Medical Center	



Orangutan Conservancy 2012 Orangutan Veterinary Advisory Group (OVAG) Workshop

2012 OVAG REPORT

July 9 – 13, 2012



Section 3

PROCEEDINGS – Available electronically with all presentations and teaching materials on request. Complete proceedings given to each delegate on a pen drive at the end of the workshop.

Introduction and welcome: Steve Unwin

Presentation of last year's workshop video prepared by Steve Unwin

Team building exercise and ice breaker: The String Game. Participants introduced each other as they passed around a string, which by the end had all participants connected to one another.

Review of workshop evaluation, which when filled out by participants, was turned in to facilitators.

Review of Working Agreement (In appendix)

Review Quiz (from last year's workshop)

All participants were given a flash drive which had all meeting materials digitally loaded on

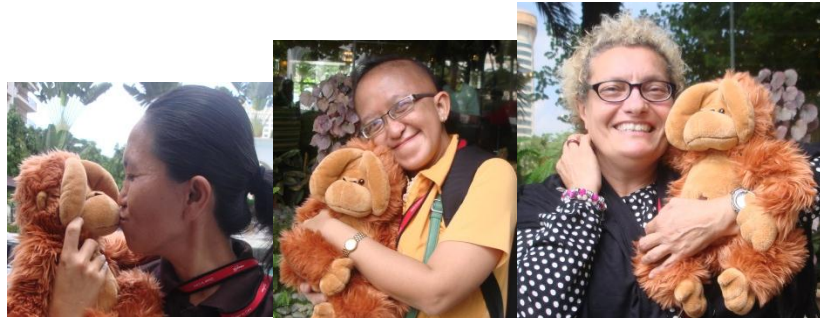
Meeting proceedings were video recorded as well as written

As in all OC/OVAG Workshops, the Participants agree to the following:

- ☐ All ideas are valid
- ☐ Discussions are recorded visibly
- ☐ Everyone participates
- ☐ No-one dominates
- ☐ Participants listen to each other
- ☐ Participants treat each other with respect
- ☐ Differences are acknowledged not "worked"
- ☐ Time-frames are observed

Participants (as part of ice breaking) conducted a contest for the naming of the mascot (toy flanged male orangutan donated by Steve Unwin): GAVO (which was presented to Raffaella at the end of the workshop)





Overview of when working with animals: Steve

Important to have team work

Personal protective equipment: used correctly

Someone with you to stay safe

Light

Recognize the hazard – identify it

After the above, you are then prepared to do something about it – together and safely for a job well done

How to prepare for a disease outbreak (pdf attachment distributed) - Steve

Do not panic: Before / During / After

1. Risks to humans and other animals – can be adapted to sanctuaries, reintroduction centers and wild field sites: can be applied to any disease and any hazard
2. Measles, Tuberculosis, *Staphylococcus aureus*, *Dientamoeba fragilis*, *Strongyloides spp.* In field sites, pathogens of human origin include h-RSV, *Streptococcus pneumoniae* and *Campylobacter spp.*
3. Who takes responsibility?

Stage 1: Risk Assessment – identify main diseases of concern – easier if this information is accumulated by a team and reviewed by others – document everything!!!! Documentation of information can then be passed on to others for future use and avoidance of repetitious work. It is also helpful to document where extra information can be gotten: ex. Papers, notes from conferring with a colleague, etc.

Stage 2: Risk Management – hygiene issues are very important to secure bio security, what do you look for? Use Stage 1 information. What disease screenings are in place?, Where do animals come from?, etc. Disease screening for staff: what information is provided for current staff, new staff, field workers? All proper protocols should be in place and understood at all locations where staff and workers are. For example: who reports human health problems?, how to deal with staff that has a health issues, what are recommendations of doctors?, etc.

Stage 3: Management of the Disease Outbreak - what protocols need to be followed in dealing with outbreaks? These are best in place before an event occurs. Fact sheet is needed of the disease in question which should include, what do look out for/any treatment or screening/making sure people working with these animals are informed (and their families should be included as animal workers can easily bring health issues gotten at work to their home).

These stages only work if they are used and if they are understood by all – clinical and non-clinical staff!

Post clearly the contact protocols if and when a disease outbreak occurs (phone number, email, etc.) Always document if contact has been made and with whom.

It may be very useful to have a press release prepared or a plan in place for dealing with the media if a disease outbreak occurs, as often there is much misinformation spread by the media which can be damaging to the project. The more you keep things a secret, the more they become a problem – which is why it is best for you to be in control of the information by being well prepared beforehand.

Mapping the Pathway Review – examples (hard copies and digitized copies distributed)

Remember: Keeping Clean and Protocols in animal areas – Always have proper protective clothing available for personnel – Signs should be posted for importance of washing hands before eating, drinking, and smoking.

A Risk Assessment Template was copied to each participant's flash drive.

Discussion of PASA Operations Manual

The hope is to produce a similar veterinary operations manual for Indonesia and Malaysia. The PASA manual was digitally distributed.

PRESENTATIONS

Hutan Project (KOCP) – Kinabatangan Wildlife Sanctuary (Malaysian Borneo): Mislan

Mislan gave a review of their program. The program focuses on: varied wild forest species data collection (orangutan, other primates, forest elephants, birds, reptiles, amphibians, small mammals etc.), working with and improving local communities, education, dealing with wildlife/human conflict, encouraging and inspiring local community involvement in conservation, Homestay programme to bring

money into the local village, connecting bridges for orangutan use of forests, and monitoring Red Ape Encounters, a tourist group which operates within the park.

OURS Unit – Orangutan Research Unit: 12-14 hours daily follows of 6.2 km² study site. The orangutan ranging area is semi swamp, dry hill forest, and tropical forest. Behavior, feeding ecology, phenology and population densities are all recorded in this secondary forest. Orangutans in the study area usually spend 50% of their time feeding and 34% of their time resting. This group also spends time feeding on the ground.

Overview of Sabah Program –Felicity (KOCP)

Located in Sepilok, is the Morio subspecies, it is possible that the Morio subspecies is actually two subspecies (more research needed to determine if this is true). The project focuses on taking orangutan census in the area, which is a very compressed landscape in a post conversion agricultural area. However, there is still remarkable bio diversity present. There are also continuing ongoing threats, continuing fragmentation, poaching, increasing wildlife tourism, increasing concern about changing behavior due to tourism. In the Sabah area, 62% of orangutans live outside of the protected area. About 25% of the wild orangutans live in protected areas, 25% live in land conversion areas and 50% live in unprotected forest.

Studies in the area have shown that there is a decline of the percentage of time spent with mother, with infants leaving earlier than what was thought of for the Bornean species (closer to proficiency of young Sumatran orangutans). This may be due to eruption of molar at 3 years of age, giving them the skills to forage on their own.

Studies of the area show that Eco tourism has had a low impact on wildlife. There appears to be no difference in parasite load as wild populations of orangutans are less heavily infested with parasites. The site sees 200 visitors per year.

There does seem to be an increased fecal cortisol levels 1 day after tourism but appears to be self-regulated

Raffaella commented that fecal cortisol is dependent upon gut passage rates and must be taken into consideration when using fecal cortisol levels – 48 hours for great apes?

Showing of Video of the work of Herman and Rahadi of KOCP

Kristin asked if there are cultural changes in attitude with the local people?

Herman and Rahadi said that yes, signs look encouraging.

Pathogens in wild great apes – Steve (Presentation provided electronically to delegates)

Sample preservation and analyses – How can you collect samples from a dead forest animal in diagnosing diseases? When are viruses lethal or non-lethal?

Examples of known pathogenic viruses: Filoviruses – Ebola, SIV (via immunosuppression), Polio, Measles, RSV

Viral examples of low, no or unknown pathogenicity: Certain retroviruses (STLV) (SFV), HBV, Adenovirus, Herpesviruses

Distance from wild life – keeping a distance of 7 or 8 meters may seem adequate but, keep in mind, if you have been standing in an area and leave something where you were standing, bio hazardous materials can last a few hours after you leave. Also important to enforce: Anyone who is ill should not be going near animals or in the forest!!!

Respiratory diseases –in some studies, diseases were brought in by the researchers – RSV rates found in chimps are very high. These diseases came from researchers (found by tracking the disease movement).

Examples of known pathogenic bacteria is both lethal and non-lethal: Anthrax; M.tuberculosis, S.pneumonia, P. multocita

Examples of known pathogenic Parasites: Protozoa, (cryptosporidium, giardia, plasmodium), Nematoda: e.g. ascarids, Strongyloides, Cestoda: (Bertiella)

Always be sure to collect samples in a way that will preserve them properly.

Frozen tissue samples: genetics (cold must be maintained), or toxicology. Frozen samples cannot be used for much of anything else.

RNA later is a preservative that preserves nuclear material in a cell. It can be kept at room temperature for several weeks or longer and always preserve several aliquots.

Specifics of testing were provided for all in digital form.

Analyses: mainly PRC (viruses, bacteria, (some parasites)

For histopathology – 10% buffered formalin

Post Mortem – sample as many organs as possible but get at least: spleen, lung, and liver.

Blood samples: plasma can be frozen (cold chain must be preserved) . This can be difficult if there is no consistent power source available. Samples can be dried on filter paper, but must be stored with silica gel.

Swabs: can be easy to use with a dead animal, but are much harder to use on living animals.

Fecal samples: Frozen, RNA later (must be mixed and shaken well), PCR analyses for coprology – 10% formalin, ethanol, SAF)

Urine: always preserve several aliquots in labeled vials.

Frozen or dried analyses: PCR (viruses, bacteria, parasites, antibody detection)

Fruit wads: Frozen and RNA later (for saliva).

Where do analyses get done?

On site if possible! Even in the forest using battery power with small equipment, on site analysis is possible as there is much available equipment for field use.

Outside of country: difficult and requirements are different for each lab. Also, permits to send bio materials out of country can be difficult to obtain.

Discussion and comments about various methods used by the participants.

TB Update - Steve

There are difficulties in validating the Prima TB Stat-Pak® blood assays in *M. tuberculosis* complex surveillance testing in populations of chimpanzees (*Pan sp*) and orangutans (*Pongo sp*) in range countries.

TB is very difficult to diagnose accurately. The Prima TB Stat-Pak was a test that was validated for macaques and the question was whether it could be used for great apes. In its present form, it cannot.

Can we improve the diagnostic accuracy of ZTB surveillance under field conditions? We are currently data deficient.

There is an unknown risk value because of human population. TB has never been found in wild populations of chimps or gorillas.

Diagnosis is very important for release projects: how sure can we be that the release individuals do not have TB?

No single test currently meets all the requirements for accurate and efficient TB screening in non-human primates. Best that can be done is to combine tests: TST and Chembio Stat-Pak? How can you validate? What is easily available? What is doable?

The Prima TB Stat-Pak was stable, and good results were reported with monkeys, and it was easy to use.

All antigens in the test are specific for antibody detection.

There was a large sample size of 860 great apes spread across 18 countries on three continents. Data consistency was a problem, and should be followed up by another test, TST, culture.

282 Chimps: there were a variety of results: 3 confirmed positive / 1 positive TST, 1 Stat-Pak - too small a sample size

302 Orangutans: there were a variety of results: 2 confirmed positives

There is a publication coming from an international group of vets in Indonesia, Malaysia and Africa who know more about the particulars of the testing.

With data being deficient, however, PCR and culture still need to be included in testing regime.

Currently, there are no conclusions.

Regarding Prima Stat-Pak, even though it did not prove useful in orangutans and chimps, at least we know it cannot be used, that, in itself, is helpful.

TB testing at BOS Nyaru Menteng – Rosalie

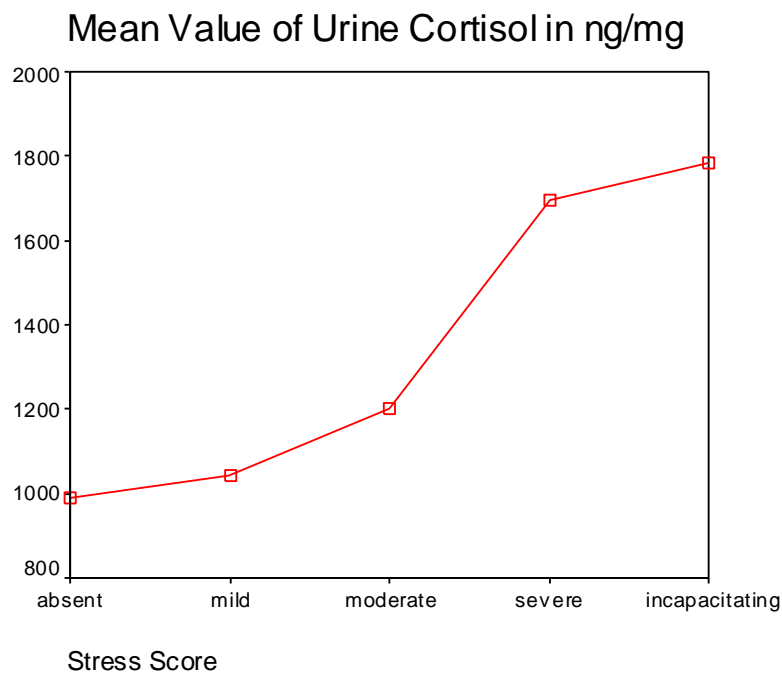
TST review: bovine compared to avian test: Comparative testing is the best option.

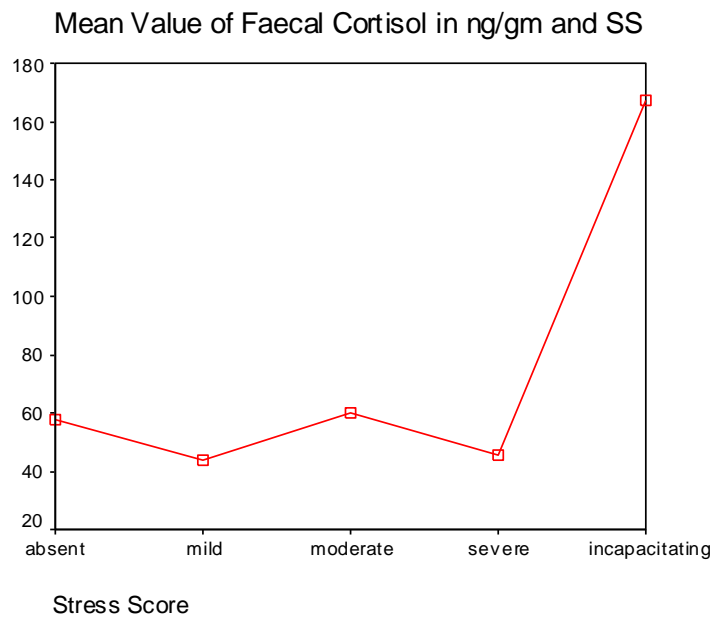
Presentation and abstract was given digitally to participants. This work will be published in a peer reviewed journal.

Stress and Urine and Fecal Cortisol analyses in Orangutans – Raffaella

Stress behaviors in a group of orangutans located at Samboja Lestari (BOS site in East Kalimantan) were evaluated for frequency and compared to urine and fecal samples collected for cortisol analysis. It was found in the study that increased behaviors that were deemed stressful were supported by increased levels of urine and fecal cortisol.

Presentation was given digitally to participants.





Indicators/Stress Signals...the mouth





Official Opening ceremonies at the University of Putra Malaysia with various University Officials and the Minister of Natural Resources and Environment. Media coverage included both national news and television representatives.

CASE STUDIES (all presentations were given to participants digitally)

Limb amputation – Yenny (SOCP)

Health Screenings in Orangutan – Agus (NM-BOS)

OU reintroduction Program Nyaru Menteng (NM)

610 individuals in the center – repetitive health screenings because of longevity of program

Anesthetic....ketamine (various)

Body Measurements and various data collected: age/teeth, circumference of head, length of arms and legs and body weight along with a general examination, gender check, chest auscultation, O₂ saturation, heart rate, and respiratory rate; followed by implantation of microchip.

Also, several TB tests are administered: APPD/BPPD – now combo of avian and bovine. This testing replaces the Mammalian Old Tuberculin (MOT) that was used in the past.

Blood samples are also taken and chest x-rays on portable machine – orangutans sit up and are strapped similar to when laying down which gives better images as images are obscured when taken with orangutans lying flat.

Sputum samples are also collected – acid fast stain for MTb.

PCR TB Procedure:

Culture for MTb – bacteria

Tracheal wash: Laryngoscope, xylocaine spray, end-tracheal tube, feeding tube, sterile saline 10 ml, 10 ml syringe, plain sterile tube – not to be reused!!!!

TST checked 24, 48 and 72 hours

X-ray assess and if there are doubts, x-rays are reviewed by a radiologist

Sputum: sent to Biofarma: PCR TB 1 week, culture for TB minimum of 2 months

Hematology – performed in house ABAXIS HM5

GROUP DISCUSSION:

Varied questions from participants regarding procedures and lab work

Question on the simple masks – are they sufficient when working with TB individuals? When working with definite positives, a different stronger mask is used – but suggestion was made that the stronger mask be used for all close contact procedures (even though it is difficult to breath with the stronger mask)

Steve will look into a free version of records keeping system used by ISIS

How often should centers check for TB? Depends on the frequency of new animals coming in – perhaps annually is sufficient - but if many are coming in a month then more so – if less individuals are coming in a month, then less so –

Citra of Samboja Lestari proposes every 6 months or annually, but now they are tested opportunistically and depending on the situation

Escaping. Ill female: Mirri – Meryl (NM/BOS)

Mirri, a 13 yr old female weighing in at 38.2 kilos has been in Nm for 10 years in a cage and was always breaking out . After one escape, she began to eat very little– then muscle spasms began as well. She was moved to isolation for ICU – blood samples were taken. Blood work was normal except Neu was high / blood chemistry: General exam – mostly normal. She did have a small wound but it healed.

Possibly Meningitis/Tetanus? The lab, however, refused to do more blood work.

Began anti- tetanus serum, tramadol 50 mgm , and Diazepam for spasms, Neurobion for nerves, and IV infusions

Mirri experienced spasms every minute, lasting 15 minutes. Experienced loss of appetite for food and drink – antibiotic ceftriaxone 40 mg – then repeated blood work –no change but better. Her appetite improved but she was still having spasms though they seem to reduce when there is quiet around her, so, she was kept isolated. Finally, by the end of May 2012, she was eating and had no spasms (just some slight ones) .

Most participants concurred that it was tetanus – usual recovery time: 7 days.

Release Process – Orangutan Release Program at NM – Agus (NM/BOS)

Candidate selection: distinguished between wild/semi wild/rehabilitant

Health screens: TB test, tracheal wash, fecal parasite check, bacteria check and basic general examination as described in above case study

Implanting of radio transmitter: if placed directly under incision, problems can occur and might need re-stitching – many transmitters broke (cracked)

New method: small cut – and a small pocket is made and slipped in – rather than in the incision – then incision is stitched up

Pre-release are cages equipped with foot baths for technicians/staff use

Sputum sample for TB PCR are repeated to be certain release candidates are clear of disease

Fecal parasite checks are also repeated, genetic samples are taken, using, blood, hair, and nail, and fingerprints are also taken.

Prior to release: individual(s) are sedated, placed in transport cages and then loaded onto plane, then, air lifted by helicopter to release site. The journey continues via boat to release area where cages are opened for release of individuals into new area. Observations follow using radio telemetry to track them.

Release team is also given health screening – 15 orangutans have already been releases, 8 more to follow soon.

Enrichment application at Jambi release site – Winni (SOCP)

148 orangutans have been released in this area of Sumatra. Thirteen have died and there has been repeated siting of the rest of the released group.

There are times when orangutans are kept in cages waiting for release, and therefore need enrichment.

Purpose of enrichment: allows for needed mental stimulation, can improve physical fitness and longevity, decrease aggression, increases a normal behavioral repertoire, can improve survival, learning, adaptation and coping skills.

Enrichment was provided at 10:15 / 12:00 / 2:15 / 4:00 and included artificial enrichment, leaves, natural enrichment, and leaves for nest making.

Types of enrichment provided and time spent:

Metal feeding puzzle –15 min - 1 hour interest

Kong toys – fill with fruit – up to one day -

Fire hose – chopped fruits in side – 5 – 15 minutes

Rice bag- fruit inside and leaves tied closed – up to one day

Fruit basket - 1 hour

Green ball – toy – fill with fruit – 15 minutes

Fishing – 30 minutes (sticks to grab fruit into cage)

Leaves parcel- chopped fruit inside and wrapped with leaves – up to 1 hour

Leaves with honey smears – 30 minutes – some leaves and branches with honey or banana – most have nothing

Bamboo tube – fill with fruit cover with leaves to plug hole – 45 min

Natural enrichments:

Bamboo shoot and young bamboo – 1 hour

Banana stem – 20 min

Sugar cane stem – 45 min

Termite nest – 45 min

Rattan stem – 30 min – not used anymore as causes conflict with human

Forest fruit and leaves – 30 min

Browse 0 play or make nest – one day

Leaves for nest – day and night

Evaluation was conducted each month for each orangutan (10 individuals)

Melioidosis: case review of Merudu – Rosa (Sabah Wildlife Department)

Fatality who was rescued in 2005 where orangutan had been kept by a villager before being sent to Kota Maradu

Original checkup showed Merudu was free of melioidosis and malaria, then at a later check showed a high body temperature and no appetite for 4 days

Treated and given supplements but symptoms persisted – then stabilized but low weight persisted.

Merudu was very pale and more meds were administered. Temperature stabilized, but other symptoms persisted: labored breathing and crackling in lungs followed by sub normal body temperature

Very dull and salivating – pale and dehydrated – 10 kilos (5 kilo loss since arrival) pale mucous membrane - Submandibular lymph nodes enlarged, more crackling, signs of pain – more meds – then death.

Post mortem:

White covering on major organs – irregular shaped lungs, with hardened areas and white nodules - abscesses and discolorations - pus oozing out of lungs, liver enlarged and yellow (hepatitis)- spleen enlarged with pus - mild enteritis, enlarged lymph nodes filled with pus

Materials sent to Department of Veterinary Services in Sabah – *Burkholderis pseudomallei* – Melioidosis

Padi (rice) farmers get this disease because of direct contact with soil – usually high in Sabah and Sarawak. Was first found in pigs in Sabah in 1963.

Orangutans: - 1st cases, 1972, 1974, 1975, re-emerged in 2005, 2012 (21 positive cases) 13 fatalities

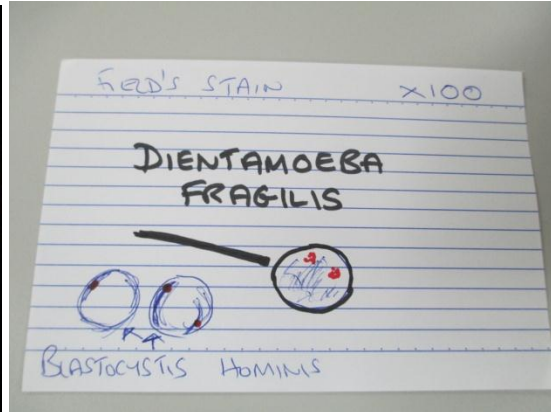
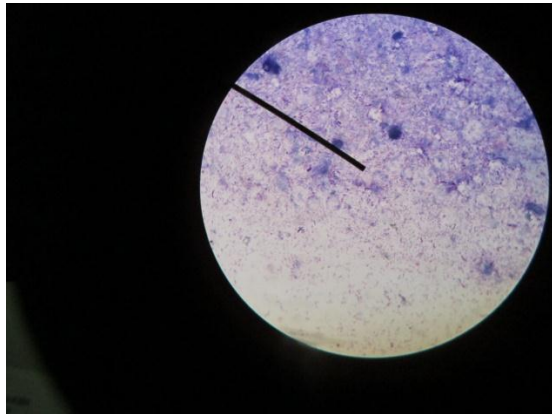
Veterinary management of infants at orangutan island Bukit Merah Laketown Resort - Sabapathy

The breeding and infant care of orangutans in this 'resort' facility. Recurring problems with low birth rates (1.5 kg) – infants are isolated from the mother and complete blood profiles are taken – all vital signs are monitored, blood glucose is checked and feeding occurs every 30 minutes to every hour. Infant group includes incubator babies. Health issues are treated accordingly.

Group Discussion: Why is there breeding at this facility? Aspects of the negatives of breeding in captivity in this particular setting were discussed.

Video of facility shown.

Practical day 1. Parasite Workshops – Facilitated by Ruben (UPM) and Wendi (LSTM) – this section of the workshop was filmed to create an audiovisual teaching aid that will be used in future workshops





Parasites specific to Primates: review and updates for diagnostic recommendations

1. Anthropods – quite common
2. Lung mites
3. Pentastomids – similar to worms but are actually anthropods
4. Ecto-anthropods: sucking lice (feed on blood), biting lice (feed on skin)
5. Mange mites
6. Fur mites (very itching showing small white dots)
7. Burrowing mites
8. Fleas and ticks (fleas are not very common but ticks are!)
9. Bot flies
10. Mosquitoes
11. Large biting flies

Blood Protozoas:

1. Malaria (Plasmodium spp)
2. Kinetoplastid (Trypanosoma spp) – not normally found in primates but needs further research

Helminths: found in both wild and captive orangutans Hookworm spp, Ascaris lumbricoides, Trichuris trichiura, Strongyloides fulleborne, Enterobius vermicularis, Ternidens, Oesophagostomum, Trichostrongylus, Bertiella , Fasciola, Dicrocoelium

Loads for orangutans in rehabilitation centers are always higher, most likely due to human and ground contact. Dosages and medications need to be changed often in these cases.

Fecal Demonstration – Wendi (LSTM)

Does fecal float or sink?

- Vets traditionally have been taught use of flotation using solution of known SG.
- Medics traditionally use sedimentation techniques.
- Is there a difference in sensitivity of the 2 techniques?
- Is there a place for both techniques?

Place for each technique:

- As a routine *diagnostic* tool sedimentation (formol ether) will detect all ova/cysts and larvae- using between 1-2g faeces/10ml tube.
- Post treatment test-of cure- sedimentation useful; flotation may be useful if looking for elimination of a *specific* parasite *as long as the optimal flotation solution is used*.
- If flotation is used as preferred test then to ensure some parasites are not missed > solution should be used for routine testing.

Is it worth performing an egg count?

- In humans not necessary , traditionally if large numbers of HW ova seen counts were performed (? hookworm anaemia) but not used frequently- tend to treat the infection : use of a standardised “+” system may be used to ensure HW load is decreasing.
- In veterinary medicine McMaster egg counts traditionally used (hoofstock) – is counting parasite load necessary in primates ?

Field Site Visit to Zoo Negara - all participants

Participants were given a talk by the Zoo Director and we were asked to do a zoo walkthrough and offer evaluations on exhibits, particularly, the orangutan exhibit. Group Photo.

Practical Day 2.

Cardiac Ultrasonography – utilizing techniques from the European Great Ape Heart Project). Steve and UPM staff

Orthopaedics and fracture repair – UPM staff

Primate Necropsy technique – utilizing the specialized primate necropsy programme developed by Lincoln Park Zoo in Chicago. This forms part of the materials for the ‘What to do in a disease outbreak’ protocols – Steve

Haematology and blood gas analysis – Barbel (Abaxis)

Portions of these workshops were also filmed as teaching aids for future workshops.

Neither OVAG, the OC, or any of their supporters condone the unethical use of **any** non endangered species. Use of animals in practical training of vets is internationally recognised as necessary, and is closely monitored and regulated, as it was in this instance, by National Government and University policy and guidelines. Putra University was an amazing, professional host, providing a unique and in many respects world leading opportunity for practical training of the OVAG delegates.



Welfare and Enrichment of Orangutans in Captivity – Sumita (UPM)

(presentation and more information was given digitally regarding welfare issues)

Orangutan captive overview through the years (400 years)

Most died in captivity – 1st captive infant birth was in 1926

Captive conditions vary from being pampered to cruelty

By the time orangutans arrive in rescue centers/rehab centers they are typically in very poor condition

Welfare issues: assessment of welfare encompasses a variety of parameters: an amalgamation of subjects that do not act independently

Behavioral welfare indicators:

- Occurrence of normal behaviors

- Absence of abnormal behavior

- Absence of indicators of pain

Points of welfare concern:

- Taken from site of origin

- Transportation

- Quarantine

Rehab centers and Zoological parks – both share similar captive issues

Both need to encourage natural behaviors in orangutans

Feedback from releases need to be documented and made available so improvements can be made

Factors to consider:

Dietary management – more vegetation!!!!!! / Usable space / Social groupings / Veterinary care

Biosecurity – face masks (respirators are better than surgical masks – especially regarding airborne diseases), hand washing, gloves etc.

Group Exercise:

Groups formed during the Zoo Negara visit assessed a particular enclosure and gave it a score

Team Sabah

Team Kalimantan

Team Peninsula

Team Sumatera

The suggestion was made that, as a group, we formulate some recommendations for concerns such as welfare and enrichment that can be sent to zoos as well as rehabilitation/rescue centers.

A comment followed that, yes, this will occur but the suggestions need to come based on our collective experiences.

Comments on enrichment:

Stimulates an animal to engage in species specific behaviors they would normally engage in, in the wild

Allows for the animal to have some control over its environment

We all know that enrichment must be provided to primates, but there is no formal information on how, what, when, how often, etc.

Natural approach – mimic the natural environment

Behavioral approach – might have un-natural items but natural items can be added

Zoo Negara Charts generated by Teams:

Team Kalimantan: Enclosure unknown/Chart incomplete

CRITERIA	ANIMALS	BIOSECURITY
Location	Number	Potential Interaction Staff Public Other species / collection Other species / non-collection
Space	Sex Ratio	Environmental
Enclosure Design: Exhibit Night quarters Rotation	General Condition	
Enrichment Absent or present Nature of enrichment	Behavior Stereotypic	
Visitor Information & Signage	Feeding Routine & Diet	
	Keeper Interaction	

Team Sabah: Bear Enclosure

FEATURE	IMPORTANCE (0-10)	PROVIDED?
Adequate space	10	A bit small
Ways of avoiding enclosure mates	10	Yes
Separate sleeping dens	10	Not visible
Climbing opportunities both horizontally and vertically	10	Yes
Resting high up	10	Yes
Scratching f(a species appropriate behavior)	10	One log was provided but all animals had overgrown claws

Food supply without competition	10	Not visible
Water for drinking and swimming	10	Yes
Swinging	6	Yes
Public at safe and comfortable distance (animal stress & visitor safety)	7	Yes (> 5 meters and moat)

Team Sumatera: Orangutan Enclosure

CRITERIA	EVALUATION	SCORE (0 poorest – 5 excellent)
Indoor Enclosure:		
Size	IUCN guidelines call for minimum of 3x3x3 meters per orangutan	1
Hygiene & sanitation	Should be cleaned minimum of twice daily with disinfectant (based on feeding schedule)	2
Design & enrichment	Should have ease of cleaning and proper drainage and floor needs raising	2/1
Outdoor Enclosure:		
Size	Dependent upon number of individuals	4
Hygiene	Water flow in moat	1
Design & enrichment	Needs shelter, ropes, vegetation, more platforms and more height	1
Barrier/safety	Needs higher glass barrier	0

Team Peninsula: Enclosure unknown

Staff Health	BIO-SECURITY
Staff health screening: Needs to be done periodically Needs to be species specific Needs PPE Needs SOP	SOP Waste product management Water resources Pest control Sick staff should not be allowed around animals Sick animals should be quarantined Disinfectant management Security wall at visitor area Species specific enclosures (Ex. Chimp needs vs orangutan needs and Bornean orangutan needs vs Sumatran)

Group Enrichment Discussion:

Arguments against:

Too expensive/is a luxury and not a basic need/causes extra work/burden of research (increases variability of animal data if too much)

Thought must be given to safety of animals, staff and the public and if the animal is actually using the item, leaving room for personal animal preference and if enrichment is re-useable – how is it maintained and cleaned?

Enrichment items made need to go through the veterinarians to ensure that the items pose no danger to the animal (Kristin)

Also volunteers to a project should work within the parameters that the project dictates as volunteers may not always be aware of safety issues and benefits/negatives of enrichment

Training can also be termed as enrichment

Group Enrichment Exercise:

Question posed: What is the criteria you would like to enforce in terms of choice of enrichment and assess the risk and benefits of natural and artificial enrichment – same teams as Zoo Negara exercise

Team Kalimantan:

CRITERIA FOR ENRICHMENT	
Should not be dangerous	
Should encourage species specific behaviors	
Should be feasible : time & money	
Should consider time enrichment occupies animal	
Should consider bio-security and environmental care	
Should consider edible enrichment carefully – dietary requirements / type and amount	

ENRICHMENT	BENEFITS	RISKS
Artificial: Rice sack (plastic)	Easy to get and inexpensive Multiple uses – level of enrichment by orangutans Easy to clean and disinfect Easy to prepare	Might cause conflict with people after release (recognizable human object) Can pose dangerous health risk if re-used – disease transmission Bio security risk
Natural: Leaves/Branches	Encourages nest building behaviors Is a natural enrichment item	May cause injuries to other animals or keepers

	Often easy to get Not expensive Have long duration and are multi-purpose May have additional items: Bugs/sap/fruits/flowers/berries	Possible disease transmission Possible chemical toxicity Possible human issues if leaves are from plantation crops – after release Animals may use branches to bring in contaminated food or damage enclosure
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Team Sabah:

CRITERIA FOR ENRICHMENT
Should be age appropriate
Should be safe
Should promote locomotion skills
Should promote learning from others – “Buddy system”

RISK ASSESSMENT

	Natural Branches with leaves and fruit	Artificial Ropes and tires
Benefits	Ability to learn to identify food items Ability to stimulate natural foraging Ability to practice nest making skills Ability to learn about branch mechanics Ability to learn about sharing and competition	Practice natural swinging Good for physical exercise and development Are cheap, available and simple Can easily be moved within enclosure Are long-lasting Allows for learning about spatial geometry
Risks	Can cause mechanic diarrhea from new foods Can have pesticide contamination – Wash first! May lead to competition	Risk of entanglement/strangulation Habituation to human materials Can cause pooled water (mosquitoes, disease risk/DHF) Animals may ingest materials causing impaction in gut

Team Sumatera:

Purpose	Stimulate natural behaviors Improve survival skills Improve quality of life
Efficiency	Preparation Cleanliness Cost
Accessibility	Is source accessible or not?

	Are there any potential conflicts?
Effectiveness	Utilization time Is there possibility of habituation? Do they achieve purpose?
Safety	Are enrichment items harmful?

Enrichment Risk Assessment:

NATURAL	ARTIFICIAL
Leaves/Branches	Sacks
Benefit: nest/protection/play/forage	Benefit: blanket/hide/play/nest
Disadvantage: conflict/effort – from humans, equipment	Disadvantage: Ingestion issues/cleaning/unknown origin/harmful

Team Peninsula:

Purpose	Food based/non-food based/mixed species group?
Safety	Materials, etc.
Maintenance	Pre and post preparation/time spent/compliance
Availability	
Variety	Target group
Suitability	Creativity and innovation

Enrichment	Issues
Ice block with fruit inside	Non-toxic/develops creativity/takes a long time to explore Possible soil contamination
Natural leaves and branches	Safe and pose no risk Multiple uses: eating/making nests/etc.

Bio Security Group Exercise:

Group work on Bio security was presented along with a question/answer/discussion with a focus on reintroduction

Point rose: Misconception on word ‘release’ and what it means to people with knowledge or with no knowledge

Chart 1 Arrival at Center:**General Examination:**

Deworming/Body Weight/Body Measurements	
Quarantine:	Kept isolated?/How long/Staff health check/Micro chipping

TB Test	Blood	Feces	Urine	Skin Scraping
TST ZN stain (tracheal wash) PCR, Culture (tracheal wash) X-rays	DNA Hep B,C Hematology Biochemistry Thick and thin films Bank serum Widal	Coprology Culture	Strip Urinary sediment	

Chart 2: Quarantine and Release Site:

Monitoring of release whenever possible: General health/Visual observation/Coprology

Needs ecological site management/Should orangutans be released where there is a wild population?

Before release	Minimum of 2 weeks recommended at release site Habituation cage for ease of release	Daily close observations (written data collection)	Observations taken by same staff member
Pre-release quarantine	Observation needed for 3 months with daily general examinations More time needed for behavioral observations	TB: TST/ZN/Stain Tracheal wash PCR, Culture X-ray, AFB	Strict hygiene needs to be observed with staff (food and waste) Avoid close contact
Sanctuary(Release)	Vaccination: No Tetanus check?	Annual health checks <one year – no >one year – yes Hematology Biochemistry Malaria Body weight & measurements Teeth/TB testing Protocols for animals tested	Sample of wild individuals – diseases of concern Long term monitoring: Duration and methods need to be specified

Film Session:

1. BOS Samboja Lestari Release – Citra (SL/BOS)

Film of the day of release of orangutans from Samboja Lestari (BOS) rehabilitation center.

Citra thanked the group because their release protocols were formulated out of our OVAG meetings – OVAG's backing helped the veterinarians enforce proper release protocols against the management's desire to release quickly.

The veterinarians were courageous in delaying the release for 3 years until it was done properly

Some areas of concern: Ministers holding babies – the veterinarians tried to prevent this but an agreement was made since they really wanted to have their pictures taken with the release candidates and having minister support was crucial for a successful release.

Kudos to the Samboja Lestari Vet team – Citra, however, gave kudos back to OVAG as it was because of OVAG that the vets were able to have their voices heard – OVAG really contributed to this release !!!!

2. Orangutan using enrichment - Chandra (A'Famosa Animal World Safari)

Film of an orangutan on ropes in his facility

Indonesia Veterinary Association (IVMA) - Andri (IVMA)

The Indonesia Veterinary Association will be having a meeting in Jogjakarta in October. Discussed was the importance of OVAG veterinarians showing up at the annual meetings. Also discussed was that at this October meeting, the OVAG vets who attend will announce OVAG to the membership of IVMA – this is big news! Also, veterinarians can get credit for showing their OVAG certificates as part of their continuing education.

Case study on a young orangutan 'Butan' - Silje (IAR)

Butan, an approximately 3 year old orangutan of 6.6 body weight had severe edema, and was very weak. Diagnosis: malaria, anasarka (generalized edema), malnourished and underweight and anemia. Treatment administered. Skin and hair was very waxy and Butan had very specific tastes. She liked ant eggs. She had persistent fevers, and showed slow weight gain. Now, Butan is 7 kg, her numbers are improving and many values are normal.

Suggestion was made about albumen not being used as it may not be safe across species.

IAR's center opened 3 years ago, and most orangutans came from Palm Oil plantations which surround the area. In 2007-2008, many rescues from local area palm oil plantations near Nyrua Menteng were sent.

Discussion on formulation of our own orangutan veterinary manual – Steve

In the areas of orangutan emergency medicine and triage – the OVAG member vets are the experts!

We all need to begin collecting material for an Orangutan Veterinary Manual. Steve will create a Drop Box depository for the beginnings of the vet manual by accumulating all the information that has been covered in the OVAG workshops.

Worms - Rosalie (MN/BOS)

Worms and the challenges of field conditions as y specimens cannot be examined quickly. Specimens often may sit for a few days – can basic setups still yield useful information?

Orangutan populations looked at were 22 rehabilitated individuals, 13 trans-located individuals, and 3 wild individuals from the Sebangau research site.

All samples were collected during the dry season in July and August of 2007. Direct smear and modified Ridley-Allen method was used to analyze samples. Prevalence: helminthes and protozoa, (but tests did not work well on protozoa). Tests were repeated from different samples from different days, to show which tests had the most sensitivity. Recommendation: 3 repeated samples, especially for helminthes from identifiable individuals

Pintung Rescue Center for Endangered Wildlife, Taiwan - Jackie

107 species live at the Center: orangutans and gibbons, several monkey species, sun bears, raptors, other birds, and tigers.

Orangutans are from Borneo - 20 in total: 14 males, 6 females, ranging from 11 to 31 years of age

10 orangutans are from confiscations, and 10 are from private owners

Center suffers from limited funding and limited space. Releases are not possible as orangutans are not native to the area.

Case study: Shin Shin, 11-14 years old and weighing 40.6 kg. She is a healthy individual and Jackie wants to place her somewhere else.

Suggestions made: Bringing her back to Borneo is very tricky and it might be better trying to get her into another zoo.

History of National parks in Malaysia – Sumita (UPM)

Emphasis for the parks is on providing proper care and husbandry to wild animals in captivity. There are 40 zoological parks in Malaysia. There is a Wild life Conservation Act 2010 – assessing zoos in

Malaysia – 8 large zoos and about 32 smaller ones – most are undergoing renovations to comply with government standards for captive wildlife.

Presentation continued with the idea that there is a difference between enrichment and furniture in captive exhibits.

Sumita proposes to begin an International Society for Zoo Animal Welfare.



Orangutan Conservancy 2012 Orangutan Veterinary Advisory Group (OVAG) Workshop

2012 OVAG REPORT

July 9 – 13, 2012



Section 4

Closing – Raffaella (OC)

Please use the friends you have made all the year through – if you need any kind of assistance; please feel free and confident to email anyone of us from the contact list.

Begin accumulation of materials for the orangutan veterinary manual as well as information for a parasite data base.

Next year's workshop –Bogor, Java, Indonesia June 24 – 28, 2013

At closing, participants were grouped into threes and asked for 3 words that described the workshop:





Orangutan Conservancy 2012 Orangutan Veterinary Advisory Group (OVAG) Workshop

2012 OVAG REPORT

July 9 – 13, 2012



Section 5

1. Delegate feedback. Largely positive – issues responded to below.
2. Tabulated results of review quiz. Delegates did not do as well in this as they did last year. In 2013, we will make efforts to repeat the quiz at beginning and end to assess improvement

Delegate feedback. N=27

New Knowledge: Did I gain useful knowledge?

Strongly Agree 20. Agree 7.

New Ideas: Did I gain new ideas that will improve the way I do my job?

Strongly agree 20. Agree 7.

Applying the learning: Will I use the information?

Strongly agree 17. Agree 7.

Applying the learning: Have I been shown how to impart this knowledge to colleagues and managers?

Strongly agree 12. Agree 15.

Effect on results: Do I think the ideas and information provided at this workshop will improve the way I do my job?

Strongly agree 15. Agree 12.

Effect on results: Do I think the ideas and information provided at this workshop will improve the health of the animals under my care?

Strongly agree 13. Agree 14

Best Things Comments

- Great experience, learned a lot and made a lot of friends
- Practice of new things/technologies - especially cardiology, parasite diagnostics, bone pinning, ultrasound & best necropsy workshop ever.
- Connecting and exchanging ideas/opening communication with colleagues/other professionals - especially in small group discussions and case studies
- Gained useful information & practical skills that can be easily applied in the field
- Discussions & so much good food!!
- Take-home information resources (e.g. memory sticks)
- Collaborative, enthusiastic spirit
- Strengthen collaboration/network of people working with orangutans

Things to improve comments

- No negative comment - I have a lot of homework to make improvement and share with my centre
- Too much material in a short time - try to focus on one big topic per day. Decreased effectiveness in last few days as tired and not able to concentrate.
- **A: noted, and this will be altered for 2013. In 2013 we will be tackling a topic per day, including practical work and more time to discuss, to better assist delegates. This should help cover most concerns listed here.**
- Tight schedules - need to be more loose to digest info and time during breaks to share information
- More time for discussions - must be moderated to allow less dominant individuals to give their opinion/more case studies & experiences
- Discussions clearly differentiating rehabilitated and sanctuary (zoo) orangutans and management issues - more understanding/less criticism.

- Discussion on Friday - tackle different topics based on suggestions of what centres need to work on
- More time for practical skills (lab/surgery) especially techniques applicable in the field.
- Strengthen in-situ experiences & procedural practices
- Better biosecurity (ie goggles) for possible zoonotic diseases in macaque procedure
- Invite people from Indonesian/Malaysian zoos to share experiences & invite human specialist (Radiologist/cardiologist/nutritionist/surgeon)
- Invite local people who live in natural orangutan habitat to study orangutan behaviour.
- More information on how to carry out risk assessments
- More research collaboration with the university - some good subjects for undergraduate/masters & doctoral students
- *Banyah logi discun tpntang studi kasus*
- *sudatt ada ki perfumuan ini, tapi masiti kurang banyak waktunya*
- Orangutan data base comparing zoo and rehab/captive orang-utans
- Too cold!

How will I use the information I have gained comments

- I need to improve and learn english better so if I have the opportunity to join this workshop next year, I can share something and give a contribution to OVAG
- I'll pass the information to management & help the organization make better decisions for the orangutan's future/monitoring of animals
- I will share with students and colleagues & to help other vets who work with orangutans
- Personal education, to collect donations and inform others about orangutan work
- Improve captive welfare of orangutans & assist to modulate enrichment programmes/solely natural enrichment
- Improve health screening steps, SOP reviews & know whom to ask for more information.
- Better capacity building of staff and improve biosecurity
- Incorporate into educational activities & lectures of under and postgraduate student to increase effective participation in conservation.
- Pass information to Natural Resource Conservation Agency about techniques and the handling of a case in court

Quiz for workshop

Circle your preferred answers. For questions that need sentence answers, please be as brief as possible. The results of this will help us determine how good we are at sharing information at these workshops, NOT to test your knowledge as such.

Remember - Some questions have more than one answer Good Luck

PARASITOLOGY

1. The most sensitive method for diagnosing Strongyloides infection is:

- A Antibody detection test
- B Formol ether concentration
- C Faecal culture
- D Saline preparation for motile larvae.

2. The stage in the life-cycle of the malaria parasite most commonly seen in a stained blood film is the:

- A Merozoite.
- B Sporozoite.

- C Trophozoite.
- D Gametocyte.

3. Finding an amoebic cyst of 18µm in diameter with 8 nuclei in a stool may:

- A Indicate the animal has amoebiasis.
- B Indicate the animal has a non-pathogenic infection.
- C Indicate the animal could also have anaemia.
- D Be the cause of diarrhoea.

ANIMAL HEALTH PROTOCOLS

4. Define 'biosecurity'

5. Which of the following are components of a disease or pathogen contingency plan?

- A. A list of people and organisations to contact in a disease outbreak, and why they must be contacted.
- B. Biosecurity protocols
- C. Methods of disease transmission and management strategies to reduce transmission
- D. A map of your facility
- E. background information on the disease of concern

6. List ways pathogens and disease can be transmitted. (as many as you can).

7. For each answer to question 6, describe one way of how you can break that transmission

8. Define disease risk analysis

9. Define malnutrition

10. Briefly describe the dietary components necessary for a juvenile orangutan

PRACTICAL ANIMAL HEALTH

11. After anaesthetising an animal with Ketamine and Medetomidine, how long should you **ideally** wait before approaching the animal to begin a procedure?

- A. 1 minute
- B. 5 minutes
- C. 10 minutes
- D. 15 minutes
- E. 20 minutes

12. In radiography – the Higher the kV

- A. The faster the electrons are at hitting the plate
- B. The more electrons are hitting the plate
- C. The greater the tissue penetration
- D. The more Xrays produced

13. In 1 sentence, why do we collimate radiographs.

14. In one or two sentences describe what a cardiac biomarker is **and** explain how it can help determine the cardiac health of an animal

15. List other ways to investigate cardiac health.

SCIENTIFIC INVESTIGATIONS

16. List the following types of investigative studies in order of result reliability, with the most reliable first

- A. Cohort Studies
- B. Expert Opinions, textbooks, personal experience and the internet
- C. Systematic review
- D. Randomised control trial
- E. Meta-analysis
- F. Single Case report
- G. Case series

17. What are the top 5 sources of information you would make use of when faced with a medical issue you need to investigate

18. For each of the following diagnostics, state whether the test is looking for the Mycobacteria itself, or for the body reaction to it

- A: TST
- B: 454 Sequencing
- C: Statpak
- D: Paralens
- E. MAPIA
- F. Culture

19. Describe latent tuberculosis

20. How do you test for Tuberculosis?

ANSWERS

1. C

2. C

3. B

4. Similar to: Protocols designed to reduce the risk of pathogen transmission

5. They all are

6. Faecal-oral, direct contact, Aerosol, indirect (soil/ water/vector), body fluids

7. Hygiene (hand washing), PPE, etc

8. Similar to: Disease Risk is the likelihood of the occurrence and the magnitude of the consequences (severity) of a pathogen entering a population – for this you need a vulnerable population and the possibility of exposure, to a particular pathogen. The analysis is the process to quantify or qualify this, to assist in animal management decisions.

9. Similar to: Malnutrition occurs when the body does not get the right amount of vitamins, minerals, and other nutrients it needs to maintain healthy tissues and organ function and can occur when an animal is either undernourished or overnourished.

10. This will vary – but should include reference to wild diet, sanctuary diet, water access, and potentially energy, macro and micro nutrients etc,

11. D

12. A and C

13. Similar to: To control the size of the primary beam and improve image clarity and to reduce scatter.

14. B-Type Natriuretic Peptide (BNP or NT-ProBNP). Measure of volume overload / ventricular stretch / ventricular stress. Cardiac Troponin (cTn). Measure of cardiac damage

15. Imaging (ultrasound/ ECG/ Radiograph); exercise tolerance, secondary – body condition/ dietary history, genetic markers etc.

16. C, E, D, A, G, F, B.

17. Open to interpretation

18. A. body reaction. B. Organism C. Body reaction D. Organism E. Organism F. Organism

19. Similar to: Infection with *M tuberculosis* that has been contained by the host's immune system and thus does not infect others

20. As many modalities as possible – culture and PCR currently most recommended.

Question																							Average
1	1	1	1	1	1	0	0	1	0	1	0	1	1	1	1	1	0	1	0	0	1	0.681818	
2	0	0	1	0	1	0	0	1	1	1	1	1	1	0	1	1	1	0	1	1	1	0	0.636364
3	0	1	1	1	0	0	0	0	1	0	1	1	0	0	1	1	1	0	0	0	0	0	0.409091
4	1	1	1	1	1	0.5	0	1	1	1	1	1	0	0.5	0.5	1	1	1	0	1	1	0.5	0.772727
5	0	4	5	3	1	5	0	5	5	3	5	3	3	2	1	1	5	5	1	3	5	0	2.954545
6	3	1	2	2	2	1	0	4	1	2	4	4	3	1	2	4	3	5	4	3	3	3	2.590909
7	1	1	1	1	1	1	0.5	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0.886364
8	0	0	1	0.5	0	0	0	0.5	0.5	0.5	1	0.5	0.5	0	0.5	0.5	0.5	0.5	1	1	0	0.5	0.431818
9	1	1	1	0.5	0.5	0.5	0	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	1	0.5	0.5	0.613636
10	0	0.5	2	0.5	0.5	1	0.5	0	0	0.5	1	1	0.5	0.5	0.5	0.5	0.5	0	0.5	0.5	0.5	0.5	0.545455
11	0	1	1	1	0	0	0	1	0	0	0	0	1	1	1	1	0	0	1	1	1	1	0.545455
12	0.5	1	1	0.5	0	0.5	0	0.5	0	0.5	0	1	0.5	0.5	0.5	0.5	0.5	0	0.5	0.5	0.5	0	0.431818
13	0	0.5	1	0.5	0	0	0	0.5	0	0.5	0.5	0	0	0.5	0.5	0.5	0	0.5	0	0.5	0	0	0.272727
14	0	2	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0.295455
15	0	1	2	1	0	1	0	2	0	2	2	1	2	0	0	1	0	1	0	2	0	0	0.818182
16	0	0	7	0	0	2	0	0	2	3	0	0	1	0	0	0	0	1	0	0	0	0	0.727273
17	5	4	4	1	1	1	0	5	5	3	5	4	4	3	4	5	3	3	4	2	4	3	3.318182
18	0	4	6	0	0	0	0	4	3	1	2	0	3	0	5	5	0	4	2	5	2	0	2.090909
19	0	0.5	0.5	0	0	0	0	0	0	0.5	0.5	0	0	0	0	0	0	0	0	0.5	0	0	0.113636
20	2	3	3	3	2	2	0	1	1	1	3	3	2	2	3	3	3	0	2	2	1	0	1.909091
Total out of 45	14.5	27.5	41.5	17.5	11	15.5	1	28.5	22	22	29	23	24	12.5	23	27.5	21	25	19.5	27	20.5	10	21.04545