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APPENDIX I

GAS ANALYSIS RECORD FORM

Name ..... Sex .....

Birthday ...../...../..... Position player.....

Assessment Date .....

Resting Heart Rate ..... Beats/min.

Weight ..... kg. Height ..... cm.

Time (min)	Load (watts)	Heart Rate (beast/min)	V_E (l/min)	VO_2 (l/min)	VO_2 (l/min/kg)	Stage
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

VO_2max = ...l/min, ...l/min/kg.

Anaerobic Threshold (AT) .....beats/min

APPENDIX II

APPARATUS AND FORMULAR FOR GAS ANALYSIS

The apparatus used in the present study was K2 (Cosmed, Italy; Dal Monte et al. 1989). The components of the K2 system are show in Figure 1. The K2 system consists of a face mask to sample expired air, a sensor to measure ventilation and oxygen concentration in the air and a transmitter, an electrode to pick up heart rate, a battery, and tube and cables to connect them to each other, and receiver. Figure 2 shows a subject carried was about 850 g.

Figure 3 illustrates a block diagram of the K2 system. Expired air was conveyed through the face mask to a turbine-flow meter. A photo-detector measured the velocity of revolutions of the turbine and from velocity flow volume was calculated. Ventilation (V_E) at body temperature and pressure, saturated with water vapor (BTPS) was determined at the transmitter. Part of the expired air was sampled from a pick-up located near the turbine and fed into the transmitter, where oxygen concentration of expired air (F_EO_2) was obtained by polarographic oxygen sensor. Heart rate (HR) was obtained from R-R intervals of the electrocardio-graph detected by electrodes to the chest.

The VO_2 at standard temperature and pressure, dry (STPD) was calculated assuming that RER = 1.00 using the formula:

$$VO_2(STPD) = V_E * (F_IO_2 - F_EO_2) (STPD)$$

where F_IO_2 is fractional concentration of oxygen in inspired air and was assumed to be 20.9%.

The V_E, VO_2, ventilatory equivalent (V_E/VO_2), respiration frequency (f_R) and HR were calculated and displayed and/or printed by the receiver. These data were also stored in the receiver for later analysis by a personal computer. Interval of the calculation could be set at 5, 15, 30, and 60 s. The telemetry convered a distance of about 100m, unless there were obstacles between the transmitter and the receiver.

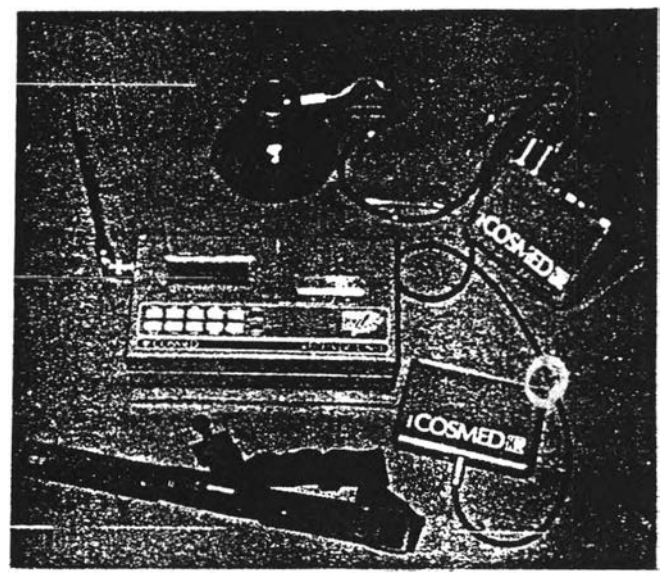


Figure 1. A telemetry system measuring oxygen uptake (K2) used in the present study. The K2 system consists of a face mask, a transmitter, a receiver, an electrode for heart rate recording, a battery, and connectors.

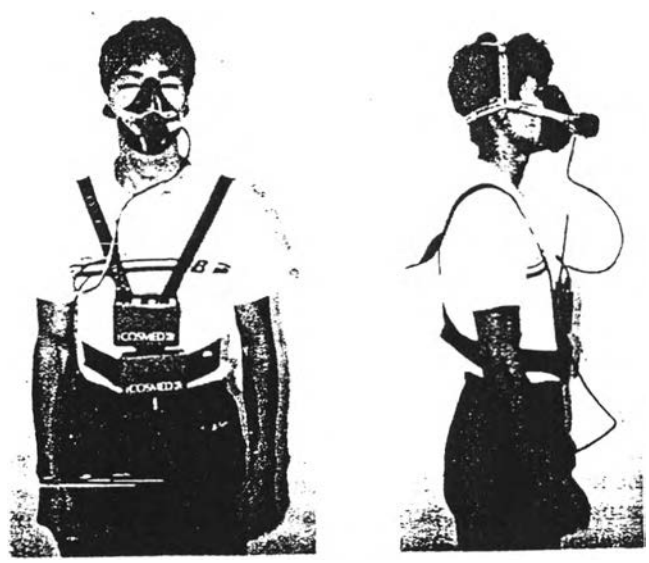


Figure 2. The K2 equipment as worn by a subject. Total carrying mass is 850 g.

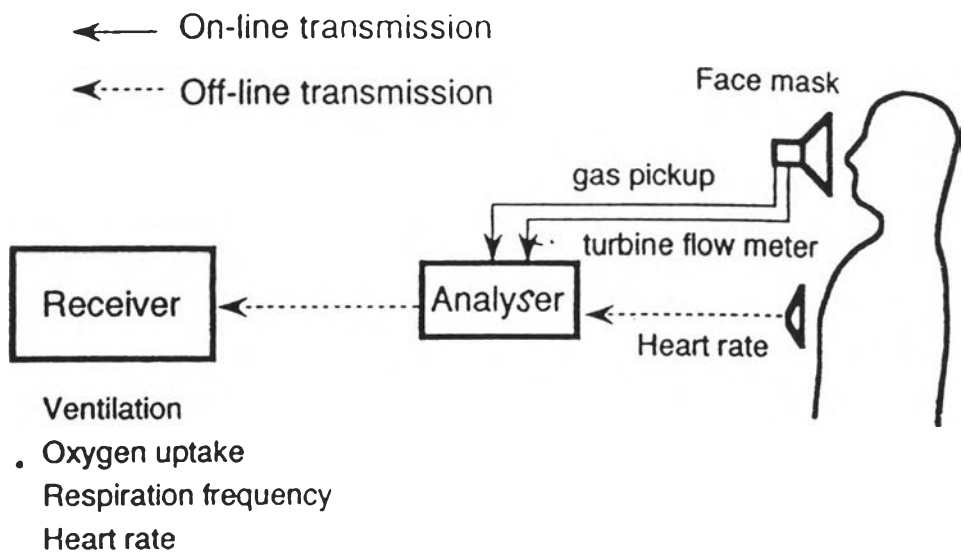


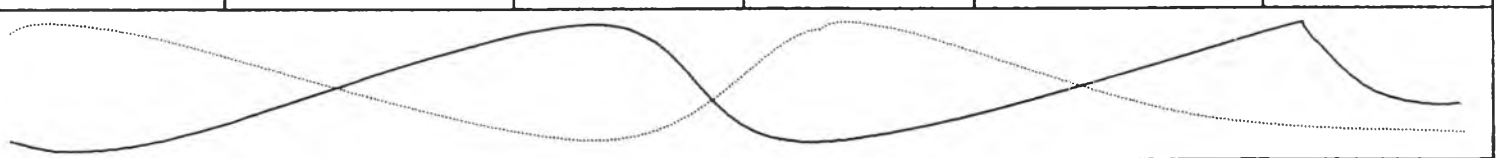
Figure 3. Block diagram of the K2 system. Expired air is passed through the turbine flow meter and ventilation is calculated. A sample is taken through a pick-up tube to a sensor at the transmitter to measure oxygen concentration.

Periodised Training Plan of Thai National Sepak Takraw Athletes

Year: 1998

Type: Female

Coach : Assistant Professor Suwatchai Kartmak

DATE	Month	July				August					September				October				November					December			
	Week(Date)	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27
CALANDAR OF COMPETITION	Domestic																										
	International																										
	สถานที่	1-8 PRABOROM CUP					6-10 INDO					16-20 KING CUP												6-20 ASAIN GAMES			
Training Period	Training Period	C.1	Peparetion2								Comp.2				Peparation 3									Comp. 3			
	Strength	AA,CT				MxS				Power					P, MxS, Plyo.												
	Endurance	Aerobic Endurance				LacticAcid Tolerance, Aerobic									Endurance Specific												
	Speed	General Speed								Speed Development					Specific; Reaction time, Agility, Speed												
	Flexibility	Flexibility Development													Flexibility Maintenance												
	Skill	Hight Skill													Game Simulation												
	Psychology	Set Goal				Muscles Relaxation and Meditation									Imagery Training and Muscles Relaxation												
Test Date						ST1					ST2				ST3					ST4							
% of Volume	Physical	60				50					40				30				20								
	Skill	40				30					30				30				40								
	Tactical	-				20					30				40				40								
Intensity	100% / 70% / 40%																										

APPENDIX III

APPENDIX IV

RAW DATA AND STATISTICAL RESULTS

Table 1. Physical characteristrics of subjects.

Position Players	Age (Year)	Weight (cm.)	Height (cm.)	%Fat	VO2max (ml/kg/min)	HRmax (bpm)	AT (bpm)
BACK							
1	34	50.6	155	25.2	36.6	187	154
2	25	61.2	172	23.8	38.1	177	140
3	27	53.0	158	19.6	43.0	170	140
4	28	46.0	163	17.7	48.0	175	140
5	17	51.0	155	20.4	32.1	187	156
Mean	26	52.4	160	21.3	39.6	180	146
SD	6	5.6	7	3.1	6.1	6	8
RIGHT INSIDE							
6	23	55.4	168	21.2	42.0	172	168
7	19	63.2	160	29.5	39.6	176	146
8	17	52.6	147	25.4	48.6	187	169
9	17	50.4	152	21.0	50.9	193	160
10	25	55.0	166	22.8	42.9	178	151
Mean	20	55.3	160	23.9	44.8	180	159
SD	4	4.8	7	3.6	4.7	6	10
LEFT INSIDE							
11	25	49.0	156	22.8	33.5	172	147
12	20	58.0	165	25.2	37.0	172	145
13	25	46.7	157	21.4	44.2	185	140
14	21	58.0	154	28.1	39.0	175	142
15	28	56.8	152	29.0	42.8	178	140
Mean	22	53.7	157	25.3	39.3	177	142
SD	5	5.4	5	3.3	4.3	5	3
Mean (Pool)	23	53.8	159	23.5	41.2	180	149
SD	5	5.1	7	3.5	5.4	6	10

Table 2. The playing position responses to competitive match-play.

Position Players	Mean HR (beats/min)	Mean VO2 (ml/kg/min)	%VO2	Exp. (kcal/min)	Exp. (kJ/min)	Exp. (kcal(Total))	Exp. (MJ(Total))
BACK							
1	142	34.2	71	7.9	32.8	353	1.5
2	144	25.0	58	6.6	27.7	298	1.3
3	141	22.4	59	6.9	28.6	308	1.3
4	143	20.9	57	5.3	22.1	238	1.0
5	143	20.7	64	5.3	22.1	237	1.0
Mean	143	24.6	62	6.4	26.7	287	1.2
SD	1	5.6	6	1.1	4.6	50	0.2
RIGHT INSIDE							
6	146	24.2	48	6.1	25.3	273	1.1
7	152	26.9	63	7.4	30.9	332	1.4
8	144	21.1	50	5.8	24.4	263	1.1
9	146	21.7	48	6.4	26.8	288	1.2
10	144	24.8	63	7.8	32.8	353	1.5
Mean	146	23.7	54	6.7	28.0	302	1.3
SD	3	2.4	8	0.9	3.6	39	0.2
LEFT INSIDE							
11	132	18.0	49	5.2	21.9	235	1.0
12	127	13.6	32	3.9	16.2	174	0.7
13	126	18.7	44	5.3	22.2	239	1.0
14	137	21.6	44	5.7	24.0	258	1.1
15	128	18.9	53	4.6	19.4	208	0.9
Mean	130	18.6	45	5	20.7	223	0.9
SD	5	2.9	8	0.7	3	33	0.1
Mean (Pool)	140	22.2	54	6	25.1	271	1.1
SD	8	4.7	10	1.2	4.8	52	0.2

Exp. = Energy expenditure

APPENDIX V

SEPAK TAKRAW

The sepak takraw court and net are of the same standards as for badmintonmatches. A team consisting of 3 members is called Regu. Two teams competefor higher scores by spiking a ball into the opponents court. The same rules apply as for volley ball, with the following 4 exeptions:

1. players are prohibited from using their hands;
2. a player can touch the ball 3 successive times;
3. the players position of the defensive team is not rotated;
4. net-in service is accepted.

Ball woven of rattan stems or made of plastic can be used.

A match is composed of 3 sets. The team scoring 15 points win a set. The first team winning two sets wins the match. If both teams are tied, 13 to 13, the first team to score 13 points may choose to decide the set through 5-point match. If the teams are tied at 14 to 14, the first team to score 14 points may choose to decide the set through a 3-point match.

VITA

Mr. Tanormsak Senakham was born on 26th September 1970 at Nongkhai Province. He received his degree in Bacherlor of Science (Sports Science) from the Faculty of Medicine, Siriraj Hospital, Mahidol University 1993.