



Indigenous Peoples Food Diary

Ratanakiri Province

Cambodia

2002-2003

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Background and Rationale

Ratanakiri is a remote and isolated province of Cambodia, bordered by Vietnam to the east and Laos to the north. The indigenous people of Ratanakiri Province have a significantly poorer health status than other Cambodians¹. The population is experiencing degradation of its natural resources, diminishing food production, rapid deforestation, internal migration and land loss and confiscation. These factors are impacting negatively on the already precarious health and nutritional status of local people who are additionally marginalised through language, culture, geography, and economic factors in comparison to other Cambodians. In addition the population for the most part lives in remote villages with poor access and limited access to affordable local transport.

Malaria, tuberculosis and diarrhoeal diseases are endemic, and vaccine preventable diseases and acute respiratory infections continue to be major causes of morbidity and mortality. Studies have shown that more than 90 % of children and most women are anaemic, and rates of vitamin A deficiency are also high (2 % of children and 6.8 % of pregnant women have night blindness). 70 % of children are stunted which is an indication of chronic malnutrition. Intestinal parasite infections are universal and hygiene and sanitation in the villages is very poor, increasing the risks of diarrhoea and malnutrition. The risk of cholera epidemics is high, the last one being in 1999. The National Health Survey conducted in 2000 indicated that maternal and child morbidity and mortality rates are the highest in Cambodia with infant and under 5 years mortality at 187:1000 and 231:1000 respectively. This is significantly higher than the national average for Cambodia of 95:1000 and 124:1000. Ratanakiri also recorded the highest rates of severe malnutrition in children under 5 in Cambodia. Health Unlimited's own Health Situation Analysis in 2001 found the health of indigenous villagers to be even worse than indicated by the National Health Survey. The villagers are sometimes short of rice in the planting season and chronic ill health adds to the burden of malnutrition especially in children under 5. More than 36 % of people reported diarrhoea in the preceding seven days and 50 % fever and cough.

The majority of the population does not access government health services because they live in remote and isolated villages. The benefits of the ongoing national health sector reform have yet to reach the village people in Ratanakiri province with very little evidence of improvement in the fields of health management, financial resources, or adequately qualified personnel at health facilities in the province. Many health centre staff are indigenous people who have had little access to formal education and have low literacy skills. It is also difficult to attract better qualified Khmer staff to work in such a remote province, with travel by road to Phnom Penh taking more than 15 hours and the presence of poor facilities, such as schools, for families. This creates special challenges for improving health service provision.

Following the results of the nutrition survey, completed in March 2002, which showed that chronic malnutrition had resulted in more than 70 % of children in the ethnic minority communities being stunted and 36% severely stunted (more than 3 standard deviations from the norms) Health Unlimited decided to try to define what were the major causes of these high levels of chronic malnutrition.

There are many factors which could contribute to the occurrence of this high level of malnutrition including:

- High levels of disease.
- Inappropriate feeding habits and food taboos.
- Inadequate food supplies.

¹ Health Situation Analysis Ratanakiri 2001, Dr. Fiona Hardy

The health situation analysis and the nutrition survey determined that the level of disease in the community was very high with 36 % of people reporting diarrhoea and 50 % reporting fever and coughing in the week preceding the survey. This high level of disease results in a vicious cycle of disease causing malnutrition, which in turn increases susceptibility to disease. The incidences of vaccine preventable diseases, which make a major contribution to this problem in children, have been addressed during the second phase of the project. Immunisation rates in the 155 villages rose from 1.4 % of children in the target group possessing yellow cards showing a full course of immunisation and 36.6 % having a BCG scar to 63.3 % of the target group (children under 1 year) having been fully vaccinated. This figure will improve the rate of illness in the community but will not prevent the occurrence of vaccine preventable diseases as the levels are still not high enough to produce herd immunity. The health centre staff have been encouraged to visit the village at least once a month except in the wet season when 48 villages become inaccessible. Early diagnosis and treatment of malaria, a major cause of the high morbidity and mortality in the under fives (54 % of 10000 cases treated in the 35 villages at village level by the EU malaria project were in children under five), has been introduced into the outreach programme. The relationship between the villagers and the health centre staff has improved as a result of increased contact at village level. The health centre staff have also introduced growth monitoring and health education with regard to nutrition into their outreach activities.

Health Unlimited had also determined that poor feeding habits were contributing to malnutrition among young children. A base line survey carried out in September 2002 found that initiation of breast-feeding, duration of exclusive breast-feeding and introduction and frequency of feeding weaning foods was sub-optimal. The base line survey carried out in May 2003 regarding the feeding of sick children showed knowledge regarding the best way to combat the nutritional effects of illness was low. All these gaps in knowledge and practice have been addressed by the education programme put in place during the ECHO financed project from August 2002-August 2003. There has been a marked increase in knowledge and a change in practice following the education programme. There appears to have also been a knock-on effect to other villagers who did not attend the teaching. It would be interesting to see how sustained this change in knowledge and practice is.

The third factor, which can influence the levels of malnutrition, is the availability of food. The villagers practice swidden agriculture and also live by hunting and gathering. The indigenous people's agricultural practices, hunting and gathering are governed by the seasons and therefore determine what needs to be done on the farms at the different times of year. The farming practices and the hunting for and gathering of food are highly labour intensive. Water for drinking, cooking and washing has to be fetched from water sources that are often at some distance from the village and are carried in gourds ranging in size from 600ml to 3 litres. This is women's work. Women's work also includes pounding rice, gathering food from the forest, fetching water, cooking and working in the fields alongside the men. Women also are the main carers for sick children. This caring activity can take time away from other more productive activities.

The indigenous people's year finishes in January (Western calendar) at the end of the harvesting season.

Agricultural Calendar

The hill tribe calendar has twelve months, with month one of the hill tribe calendar corresponding to month 2 (February) of the Khmer calendar.

Month	Task
1 (Feb)	resting
2 (March)	clear new fields
3 (April)	cut trees
4 (May)	cut /burn trees/clear fields
5 (June)	plant rice/ vegetables/and corn
6 (July)	plant rice
7 (August)	weed fields
8 (September)	rest eat corn/roots
9 (October)	rest eat corn/roots
10 (November)	rest Harvest rice
11 (December)	harvest rice
12 (January)	harvest rice

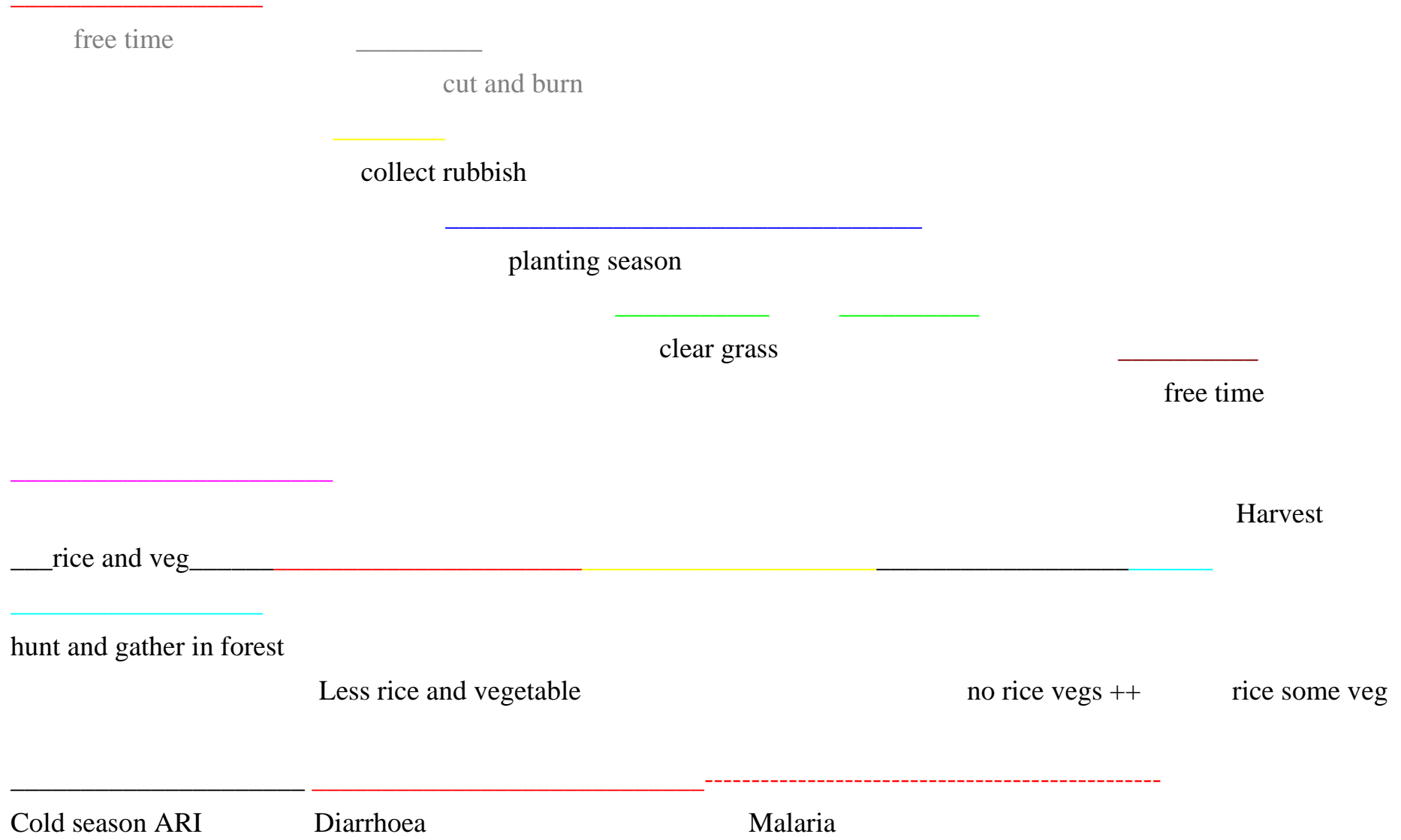
The major sacrificial festivals are held during March and April to select and prepare the fields for the new planting season. These major sacrifices occur during the dry season when food from other sources is more difficult to obtain. The meat from the animals, usually chickens, pigs and buffalo, killed during the sacrifices is distributed to all the families in the village. The people have developed no skills in preserving meat and do not regard domestic animals as a source of food as they are only killed for religious purposes. Families may have access to more meat from their animals if there is illness in the family or in the village as a whole when the Arak (village spirit) or other spiritual leaders decide that a sacrifice is necessary to appease the spirits. If there is a major outbreak of disease a village, a sacrifice will be held. If only one family is involved a smaller animal is usually sacrificed and the meat shared among the family only.

Fruit such as bananas and the products of banana trees are available all year. However there may not be equal access for all families. Fruit trees planted in the villages and chamcars (fields) belong to individual families who sell the products either to other families or in the markets in Ban Lung or other district towns. There are some wild fruits such as bananas and rambutan which can be gathered by the general population. There seems to be a tolerance of children picking some fruit from trees that do not belong to their family to eat on the spot.

A discussion was held with the people in three villages regarding the seasons and activities of the agricultural year. The main activities correspond to those previously described. Gathering in the forest continues all the year as there are very few foods that the villagers conserve in any way except for fish which is often salted and preserved ("prohock" fermented fish)) for use in time of lack of other sources of protein. Vegetables from the farms are in short supply during the dry season and must be supplemented by gathering and hunting. The calendar is represented graphically below:

Food Calendar for Ethnic Minority Groups

Jan	Feb	Mar ch	April	May	June	July	Aug	Sept	Oct	Nov	Dec
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As can be seen from this diary the people lead a very busy life. This diagram also illustrates the fact (confirmed by the collection of information over the last year) that rice shortages commence as early as May and can continue till the next harvesting season in November /December. Rice shortages can be exacerbated if the family has to sell rice to buy materials for house repairs or more usually for healthcare costs both to pay the traditional healers and the government system.

Until recently the indigenous people had a largely non-monetary system; barter and exchange were the mainstream of commerce. However the economy is becoming increasingly cash based. The sources of cash for the indigenous people are few. Some obtain money from tourists visiting the villages and partaking of Festivals, often ersatz, ones. Some sell excess produce in the markets. This again is a labour intensive activity, as people, usually women, have to walk to the markets carrying the produce in a basket. The journeys can be more than 10 kilometres each way. The basket full of produce will not produce more than 4000(\$1) riel income. If any one in the villages requires transport they have to pay for it. Villagers who have acquired a motorbike will take them to the town or health centre for a considerable fee, 15-20000 riel; even in an emergency this fee is rarely waived. The Arak and other traditional practitioners can charge up to 20,000 riel for advice and the Traditional Birth Attendants are also beginning to charge cash for their services (from 5,000 to 10,000 riel).

Many villagers are adopting the commercial practices of the incoming Khmer. They have sold land. They have cleared extra land for cash crops such as cashew nuts, which they believe bring an easy profit. On the positive side they have also started to plant maize in between the rice plants with maize being ready to eat in July and August at which time rice supplies may be running out. The villagers as yet do not dry the maize or make it into flour for use at a later date. Some villages have developed rice banks allowing rice to be lent to families who have run short. However the rice has to be repaid, which may mean another shortage in the next year.

Hunting and gathering tend to go on all year but are most intense when food produced in the farms is at its lowest. Fishing in villages that are close to a river or lake also takes place all the year. The fishing activities of the indigenous people are also threatened by the building of hydroelectric dams in Vietnam, which cause the river levels to fluctuate widely and disturb the fish breeding patterns. Commercial fishing using electric shock techniques is also over-fishing the rivers, causing a shortage of stock for the indigenous people. The indigenous people try to compensate for rice shortages in other ways. They gather roots and tubers in the forest and grow several varieties of potato.

Another factor which reduces the availability of food is food taboos. A small survey undertaken in 2002 seemed to indicate widespread taboos. However closer study during the course of the food availability diary showed that belief in food taboos varied both within ethnic groups, villages and even among different families. Many people seemed willing to be convinced to change their eating habits during the course of the health education and reserved the taboos only for bad times or when specifically advised by the Arak or other spiritual leaders to not eat that kind of food. This will be explored in more depth later in this report.

The collection of information for the diary commenced in October 2002 and finished at the end of July 2003 so we were unable to finish a whole year. The information was collected in 100 villages during the course of the health education sessions.

From October till May the people were asked the following questions:

- What food is available in your village this month?
- What foods are taboo for children under five?

From May till July the villagers were asked:

- What foods are available in your village this month?
- How many times a day do you eat a meal?
- What food did you eat yesterday?
- How often does your village make a sacrifice?
- What foods are taboo for pregnant women?

The information obtained has been set out in the form of tables, which have been included as an annex.

165 different foods were named. The foods were also grouped according to whether they were collected or cultivated and whether they provided mainly protein, energy or vitamins to prevent ill health. These have been named in the health education materials as the three food groups, energy foods, body building foods and protective foods.

Food Types

Different ethnic groups do have a minor variation in the foods they eat, collect or feed to pregnant women or sick children. However all the villagers grow and collect the same foods. We have taken a selection of some of the main food types and shown the time of year they are available:

Cultivated Foods		Fruit Trees Growing Around Village	Collected Foods	
Animal	Vegetable		Animals	Vegetables
Chicken egg	White potato	Ripe banana	Fish	Rom teng leaf
Duck egg	Taro root	Ripe papaya	Big fish	Rang leaf
Beef (cow)	Pumpkin	Banana flower	Walking cat fish	Kngop leaf
Chicken	Taro stalk	Jack fruit	Eel	Katieve leaf
Buffalo	Cucumber	Pomelo	Shrimp	Spring vegetable
Lard	Cassava (manioc)	Coconut	Oyster	Ptaviev leaf
Suet	Rice	Pineapple	Rat	Prakieve
Duck	Sang hom herb		Mice	Rattan leaf
Pig (Pork)	Winter melon	Orange	Akout animal	Pecka leaf
	Sponge gourd	Green mango	Squirrel	Chava leaf
	Sweet potato	Mango	Small squirrel	Domlong
	Gourd	Ambong banana (wild)	Monkey	Cassava
	Chili	Banana stalk	Dog	Kordev leaf
	Sponge gourd leaf	Vieng papaya	Snake	Horse radish leaves
	Pumpkin leaf	Tamarind	Crab	Kanthom that
	Sugar cane	Lotus	Frog	Ankeri dei
	All kinds potato		Snail	Kteuch (cassava roots)
	Corn		Tortoise	All kinds potato
	Cashew nuts		Wild chicken	Bamboo shoots
	Long bean		Small fish	Cinnamon leaves
	Ginger		Big red ants (A crong)	Cassava leaves
	Potato leaf		Bees	Mushrooms

Cultivated Foods		Fruit Trees Growing Around Village	Collected Foods	
Animal	Vegetable		Animals	Vegetables
	Bean		Red muntjac	Toin leaf
	Mung bean		Tiger	Bass leaf
	Winged bean		Sambar	Vor pa
	Water convolvulus		Newt	Movong
	Morning glory		Rabbit	Pra prong leaf
	Morning grass		Pangolin (ant eater)	Domlong leaf
	Aubergine		Kroch wild bird	Water lettuce (spe touch)
	Eggplant		Other birds	Ag diek leaf
	Cassava leaves		Wild chicken	Po peng
	Sesame		Turtle	Tamarind leaf
	Luffa gourd leaf		Soft backed turtle	Roll (sour fruit
	Cabbage		Soft shelled tortoise	Wild rhambuttan
			Civet	Benteng
	Kakek bean		Wild pig	Tgon
	Lettuce		Fermented fish (Prohok)	Bong kuoy
	Teng bean		Honey	Pong outt
	Herbs		Bee larvae	Sam on
	Yam bean		Porcupine	Speck touch
			Choeung fish	Parkrei
			Oyster	Pou moeuy
			Bowl frog	Domrei
			Cockroach	Dei tela potato

Cultivated Foods		Fruit Trees Growing Around Village	Collected Foods	
Animal	Vegetable		Animals	Vegetables
			Pangolin (ant eater)	Douang potato
			Ksan fish	Smack leaves
			Watery snake	Bitter gourd leaf
				Prick leaf
				Kantuong
				Chok

Purchased food: noodles, oil.

It proved difficult to divide foods exactly into the three groups as eggs and meat for example are also good sources of protective foods (vitamins).

Body building foods	Energy food	Protective food
Chicken egg	Lard	Rom teng leaf
Duck egg	Suet	Rang leaf
Beef (cow)	Honey	knops leaf
Chicken	All kinds potato	Kati eve leaf
Buffalo	Corn	Spring vegetable
Fish	Sweet potato	Ptative leaf
big fish	Cassava (manioc)	Prakieve
Walking cat fish	Rice	Rattan leaf
Eel	Sugar cane	peck leaf
Shrimp	Domlong	Chava leaf
Oyster	Coconut	Domlong
Rat	Honey	Kantuong
Mice		Kordev leaf
Akout animal	Noodles	Horse radish leaves
Squirrel	Oil	Kanthom that
Small squirrel		Ankeri dei
Monkey		Chok
Dog		Ripe banana

Body building foods	Energy food	Protective food
Snake		Ripe papaya
Crab		Banana flower
Frog		Jack fruit
Snail		Pomelo
Tortoise		Coconut
Wild chicken		Pineapple
Small fish		
Big red ants (A crong)		Orange
Bees		Green mango
Red Muntjac		Mango
Tiger		Ambong banana (wild)
Sambar		Banana stalk
Newt		Vieng papaya
Rabbit		Tamarind
Pangolin (ant eater)		Lotus
Kroch wild bird		
Other birds		
Wild chicken		
Turtle		
Soft backed turtle		
Soft shelled tortoise		
Civet		
Wild pig		
Fermented fish (Prohok)		
Honey		
Bee larvae		
Porcupine		
Choeung fish		
Oyster		
Bowl frog		
Cockroach		
Pangolin (ant eater)		
Ksan fish		
Watery snake		
Cashew nuts		

Body building foods	Energy food	Protective food
Bean		
Mung bean		
Winged bean		
Long bean		
Yam bean		
Teng bean		
Kakek bean		

The frequency of consumption of the foods are not indicated by this table

Body building or protein foods

Although there appears to be a lot of different kinds of foods in this group, the availability of these foods are limited. Pigs, cows and buffaloes are only eaten when a sacrifice is made. This may be very rarely and certainly not frequently enough to provide regular meat for the population. Chickens may be eaten at sacrifices and at other times but there is no systematic breeding of chickens and the meat is not eaten on an every day basis. Since the health education programme took place people have been more willing to eat chickens and eggs. The small animals and insects included in the table have to be hunted or trapped or in the case of oysters, snails, shrimps etc have to be caught. The quantity of these will be small and the meat available limited. The effort required to catch or collect these creatures probably outweighs their nutritional value. Wild pig, wild chicken and red muntjack (a type of deer) are rare catches and much appreciated when they are caught as they provide good meals for individual families. Bee larvae are highly nutritious but are only available in the honey-collecting season, which runs from March through May. This food is often fed to children.

Fish can be a more regular supply of protein food. Those villages, which are near rivers and lakes, have a regular supply of this, although taboos reduce the availability of some of these sources to pregnant women and children. The villagers did not always mention preserved fish when asked what food was available in the village but when asked what they ate the day before "prohock" (fermented fish) was frequently mentioned. Unlike the Khmer who raise fish in every puddle, ditch and paddy field, the growers of highland rice do not seem to have fish available so widely to all villages and families.

When there are plenty of vegetables available from about July till December the catching of small animals appears to become less frequent. This can probably be attributed to planting and harvesting seasons which are highly labour intensive. The land has to be prepared by hand and hoe as animals are not used for ploughing. Harvesting is also done by hand, the individual grains being picked and placed in a basket on the harvester's front. While the rice is growing, the fields are weeded and guarded from predatory animals like cows and wild pigs who will eat the young rice. Very few fields are fenced and usually only those where an agricultural programme has been active. In the dry season and following harvest, the people have more time for hunting and gathering activities so more small game is eaten.

This diary shows, therefore, that sources of protein are inadequate; a rat does not go far in a family group of twelve people, and much effort is required to obtain it. The forest where the hunting of small game takes place is rapidly shrinking. Free grazing land for larger animals is shrinking with the encroachment of Khmer settlers, logging activities and use of land for cash crops such as cashew nuts and coffee. As explained earlier in this report, fish sources are also threatened and small wildlife is becoming less plentiful as the forest diminishes.

Other Protein Sources

The people rarely grow beans, which are a high source of protein. However bean crops are increasingly being introduced by agricultural projects. The people do not like them very much especially in dried form. The Khmer are growing soybeans but the indigenous people do not grow these at the moment. They do not dry the beans but tend to eat them green.

The system of hunting and gathering is under threat because of lack of forest. Fish sources are declining and the ability to feed large animals such as cows and buffalo in the dry season is declining in some areas where available land for wild grazing has decreased. Cashew nuts are beginning to be grown by some of the villages even in the far jungle. Large tracts of forest are being cleared to do this. Villagers see this as a crop which can be sold for cash and not for their own consumption. Cashew trees takes several years to grow to maturity and, although while they are young forest rice can be grown between the trees, their cultivation will eventually mean the loss of forest for hunting and gathering and the loss of land for planting rice. Although there will be possible profit for some families, this will likely be spent on a motor bike or health care and not on providing food for the family.

Energy foods

The main source of energy for the families is rice. This is planted from May to July and harvested from October through December. The amount of rice available to individual families will depend on how much land they have, the quality of the land, the number of people available to plant and harvest the rice and the necessity to sell rice if other expenses arise such as house repairs or health care costs (both traditional and modern). According to the questionnaires, there are very few families who do not experience shortage or even lack rice during the period from May to November.

Families have begun to grow maize in their rice fields between the rice plants. The quantity grown is small and some of it is sold in the markets. This can be a substitute for rice in some cases as it is ready to eat about August /September time. In the months of October and November, potatoes, both sweet and white, can provide an energy source. Cassava and Taro are both gathered and cultivated. Some other roots such as Domlain, a large root collected in the forest, may be eaten. This requires extensive preparation, as it is virtually inedible and possibly poisonous if not prepared properly.

All these foods do not provide energy in a concentrated form. Small babies from six months of age could not eat enough of these foods to provide sufficient energy for growth. Concentrators of energy such as fats and oils are not freely available. Oil can only be bought in the market with cash and the animals eaten have very little fat. Some tribes and families state that eggs are taboo for small children. Coconuts, which could provide energy sources if the milk was extracted, would enrich baby foods but this has not been the habit of the villagers. In addition coconuts are not grown in all districts of the province. During the course of the health education programme the use of eggs has been encouraged. The making of coconut milk has been demonstrated and the enriching of baby foods with oil, lard, honey or sugar has been encouraged in areas where they are available. There is some sugar cane grown in some villages but refined sugar has also to be bought. Honey is only available during the season of collecting from wild sources (March till May). The honey is sometimes stored and often sold in the market. In some villages close to markets and where the population have money, noodles are purchased for children.

Protective foods

There are many sources of collected and cultivated protective foods. During the rainy season there are a large variety of vegetables and leaves in the forest. Most of the families live in the chamcar (fields usually some distance from the village) during the rainy season and therefore the vegetables are easily obtainable. If the people are resident in the villages they may have to walk several kilometres to the chamcar to get the vegetables, since no vegetables are cultivated in villages except where there has been the involvement of private NGOs or the government SEILA programme encouraging the villagers to cultivate vegetable gardens in the villages. Fruit is seasonal, except for bananas which

seem to grow all year and come in many varieties. The banana trees can provide many sources of food with the flowers and the stems being eaten and the leaves used as plates and packaging for cooked rice on hunting and gathering trips as well as for trips to the chamcar. There are also some wild fruit trees, which are available to all the people. The fruit trees in the village are owned by individual families and are therefore available only to the owners of the individual trees. Some villages have a lot of fruit trees others have very few, some none at all. The collecting of mushrooms and forest plants is a time consuming business and is considered women and children's' work. It must be done daily as villagers have no means of the preserving foods. Children are often involved in the collecting of food. The leaves and mushrooms are usually eaten in the form of a stew to make them edible. The boiling of the food in this way probably reduces its nutritional value.

Although we investigated food availability by village and ethnic group, there did not seem to be a great difference in these parameters. Location was a greater determinant of food availability. Villages near to towns and markets tended to have more ability to obtain oil and sugar. Villages near rivers and lakes had more fish. In the deep forest, villagers had a highly chance of catching more large game such as deer and wild pig.

Food Availability

The following table lists a number of foods and indicates which season they are available. However no indication of the availability of foods at family level is given: -

Month	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov
Protein												
Pig				#								
Cow				#								
Buffalo				#								
Wild game	+	#	#	#	#	#	#	+	+	+	+	+
Fish	0	0	0	0	0	0	0	+	+	+	+	+
Preserved fish								0	0	0	0	0
Energy foods												
Rice	#	#	#	#	#	#	+	+	+	+	+	#
Roots etc							#	#	#	#	#	
Corn									#	#		
Potato	#	#	#							#	#	#
Protective												
Fruit												
Jack fruit	#	#	#	#	#	#	#	#	+	+	+	+
Bananas	#	#	#	#	#	#	#	#	#	#	#	#
Papaya	#	#	#	#							#	#
Mangoes					#	#	#	#				
Vegetables												
Cultivated vegetables	#							#	#	#	#	#
Gathered leaves	@	@	@	+	+	+	+	@	@	@	@	@
Mushrooms							#	#	#	#		

Food is plentiful

+ Food available but scarce

0 Food available but limited time to obtain

@ Food available in limited locations

Shortage of rice

Kreung	No of villages	No of families per village
June to Sept	7	
July-august	1	
April-Aug	1	
June Aug	2	
July-Oct	8	
May-Sept	3	
June –Oct	2	
May -Nov planting to harvest	1	
Tampouen		
May-Nov	18	All people
June –Oct	7	All people
June –Dec	3	All people
May-Dec	1	All people
April-Oct	1	All people
Jarai Andong Meas		
May-Nov	2	Lots
June-Oct	6	
June-Sept	4	
Jarai Oyadeo		
June-Sept	16	
July and August	3	
May - Sept		Drought, 1 very remote village
August and Sept	8	
Kchock		
May-Nov	1	Not so many families short of rice
June-Oct	3	
June –Nov	1	All families
none possibly later Aug Sept	1	

In some villages only five to six families may be affected by shortages of rice during May, June and

July. In some villages, especially in the Tampoeun areas, very large numbers of families are short of rice. The Kchock who live along the river appear to have plenty of land for cultivation, fare better. The availability of rice varies dependant upon the location of the village and also is dependant on the fertility of the land, and the weather. The ability to cultivate new areas when a site becomes depleted is decreasing due to the reduction in the forest, due to illegal logging. New settlers from the lowland are buying or taking land for more extensive cultivation especially of cash crops like soy beans and cashew nuts and coffee. The prosperity resulting from this is not being experienced by the indigenous people.

Frequency of eating meals (per day)

Kreung	Range
3	2-4(1)
Tampoeun	
3	
Jarai	
3	3-5(1)
Kchock	
3	

The majority of families seem to eat three times a day. The main food is rice but this is supplemented with fermented fish or stews containing vegetables, fish or sometimes meat or shrimps and snails. Small game is often spit cooked and eaten immediately. Ants and bees and other insects are eaten mainly as snacks.

Number of sacrifices per year

KREUNG		
1 Feb.	1	Feb
1 April	6	April
1	1	
1 March	8	March
2 per year	4	
3 per year	1	
4 per year May, Aug, Oct and end of year	2	
End of year	1	
Every three to four years dry season	1	
When "mathathreing" has dream	1	
1	1	Dec
TAMPOEUN		
5-6 per year	1	
New house sick or death in village something wrong in village	3	
Every three to four years dry season	3	
When meeting hall need rebuilding	1	
No meeting hall no sacrifice	5	
Dry season 1 time new year (pig)	3	
1 time in 7 years	6	
Never	4	
1 time June to pray for rain	2	
If the seven year sacrifice brings a lot of rain do it every year	1	

JARAI Andong Meas		
Something wrong in village	3	
Chamcar sacrifice 1 time per year	3	
Every three to four years	4	
Every year in every house	5	
2 times per year	1	
1 time per year	1	
JARAI Oyadao		
1 time per year April (Feb. in Jarai)	1 2	
1 time in march	3	
1 time dec	4	
1 time June	2	
No sacrifices village largely Christian	1	
Never	7	
KCHOCK		
Dry season not every year	1	
Problem in village	1	
Every five years	1	
1 time Feb.	1	
Each house every year	2	
Never	1	
2 times	1	

If a person is sick they will go to the Arak and make a family sacrifice but village sacrifices are rare amongst the Tampoeun ethnic group.

Food Taboos

The foods listed in the above charts were all mentioned during the course of the interviews; there was however little consistency among villages even amid the same ethnic group. The first time the question was asked there seemed to be several taboos. However, the next time the same villages were visited, the number of foods said to be taboo declined. In addition more people cited that there were no real taboos but that there had been taboos in the past but people no longer kept to them unless something bad happened in the village, or it was forbidden by the Arak during an illness or other spiritual healer. The people would also rationalise the forbidden foods by saying they caused illnesses. For example eggs were said to cause rashes and ear infections. Even in the developed world, eggs are often advised to be withheld from the diet of young children until they are a year because of the dangers of allergy to the egg protein. Perhaps the fears of the indigenous peoples of Ratanakiri are not without foundation. The meat that came from sacrificed animals was often not fed to young children.

As can be seen, there are a great variety of taboos but no consistency. What food cannot be eaten may depend on the health of the child or family or village and the advice of the spiritual leaders at that time. If all is going well, the women in the village seemed happy to abandon old customs as long as they experienced no ill effects that could be attributed to the food consumed. However if a family has had a bad experience with a particular food, they are highly likely to forbid its' consumption within their own family.

Foods taboo for children under 5

During the first two visits to the villages people were asked what foods were taboo for children under five years of age:

Taboo foods	Kreung	Tampoeun	Jarai	Kchock
Walking cat fish	5	1		
Fish	2	1	2	
Rat	2	4	5	
Chicken Eggs	8	6	3	2
Snake	6	14	3	
Eel	2	2	3	1
Duck eggs	4	3	3	
Monkey	2			
Dog	2			
Maseou Soup	1			
Proung soup		1		
Chicken	2	1 (during sacrifice)	2	
Beef	1			
Tiger		3		
Pork		1		
Porcupine		1	4	2
Some beans		2		
Soft shelled tortoise	1	1		
Turtle		2	2	
Chilli	9	5		
Banana flower		1		
Sour fruits	1			
Jack fruit			1	
Pomelo			1	
Raw food		1		1
Male pigs head		2		
Wild bird		1		
Cockroach			2	
Small animals		1	1	
Red ant (Akrok			4	

Taboo foods	Kreun g	Tampoeun	Jarai	Kchock
animal)				
Insects			1	
Newt			3	
Red Muntjac			5	
Intestines of four legged animals		1		
Wine		1		
Bad smelling food			1	
Only during sacrifice	2	2		
None	6	10	20	4
Only when forbidden by Arak and if someone is ill		1		

The numbers represent the frequency the food is mentioned in the questionnaire on the first visit. The number of villages reporting no food taboos at the second visit increased markedly.

There were only 6 Kchock villages surveyed. They appeared to have less food taboos for children.

Taboos in pregnancy

Pregnancy is a time of major fear for women all over the world. Equally widespread are the observation of rituals and the development of “Old Wives Tales” about what should be done and not be done during pregnancy. The ethnic minority peoples are especially subject to such superstitions, which can be linked to the high maternal morbidity and rate. Women are more easily influenced especially in their first pregnancy to follow the old customs and advice of the village wise women

Taboo foods	Kreung	Tampo eun	Jarai	Kchock
Foods that are round or ball shaped		4		
Papaya			2	
Jack fruit	1	3	18	
Ball shaped frog				
Eggs chicken	2		14	
Duck eggs	1		6	
Pomelo			1	
Domlong potatoe			1	
Aubergine		1	1	
Eggplant		1	2	
Pumpkin		2		
Taro			1	
Potato leaf			1	
Rattan leaf			1	
Banana flower			1	
Ripe fruits		6	2	
Ptaive	1	1		
Banana	1		2	
Akrock (Red Ant)			20	1
Fish		1	3	1
Walking cat fish		4	1	
Crab		1		
Meat from male animal			1	
Red Muntjac		1		
Green banana			11	1

Taboo foods	Kreung	Tampo eun	Jarai	Kchock
Sugar cane	1		10	1
Sweet tastes			1	
Sugar			1	
Honey			1	
Coconut		1		
Tortoise	3		3	
Turtle			1	
Pangolin (ant eater)			1	
Chicken		1		
Chilli		1	1	
Porcupine			2	
Newt	2			
Bamboo shoots			3	
First pregnancy only	2	3	1	2
Sitting on stone		1		
Animal skin			6	
Animal fat	1		4	
Old rice from pot		1		
Wine		1	1	
None	13	16	10	4

From this table it can be seen that the most common response from all groups is none. However this varies between families and villages. The forbidden foods are often from the vitamin protecting foods and proteins both of which are in general short supply and necessary for a successful pregnancy. No health education has been directed at pregnant women and this is an area where it appears to be very necessary. How much attitudes would be amenable to change would have to be assessed at the beginning of any project. The more surprising aspect of taboos is the forbidding of sweet food and animal fats, which are taboo everywhere but most commonly among the Jarai. The Jarai also forbid eating red ants, which are also sweet.

Conclusions

The main conclusions, which can be drawn from the diary, are as follows

1. There is a lack of energy foods.
 - In general, during the planting season there is a shortage of rice and the people are too busy planting and guarding their crops to seek other sources of energy.
 - There are a lack of high energy foods that cut down on bulk (e.g., fats oils and sugars) to feed young children.
2. There is a lack of proteins.
 - The people do not eat domestic animals (with the exception of chickens) except during sacrifices.
3. Protective foods like fruit and vegetables are lacking in the dry season.
4. Gathered foods do not contain many bioavailable sources of iron and vitamins.
5. There is a widespread taboo of eggs for children and pregnant women. This prejudice seemed to decline following the teaching on weaning and feeding sick children.
6. Frequency of eating varies with activity levels but most families eat 3 times a day.
7. Food taboos play a small but vital part in restricting available foods especially for pregnant women.

Health Unlimited needs to pursue its policy of health education delivered by ethnic language speakers. This policy appears to have had an impact on reducing some of the poor feeding practices especially in the case of young children. However, Health Unlimited alone cannot change agricultural practices and there is a need to co-operate with other NGOs and the government SEILA programme to try to introduce agricultural practices more suited to the circumstances that the indigenous people find themselves in. The loss of forest and land for cultivating forest rice will exacerbate their problems of food production and they may have to change their practices to suit the new situation. NGOs and the Cambodian government need to do more to protect the land rights of the indigenous people.