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Forty days and forty nights: A biocultural perspective on postpartum practices in the Amazon

Barbara Ann Piperata*

Department of Anthropology, The Ohio State University, Lord Hall 113-A, 124 West 17th Avenue, Columbus, OH 43210-1364, United States

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ABSTRACT

The immediate postpartum period is recognized as a special time in many societies and is commonly associated with food and work restrictions. The logic of food restrictions during a period of increased energy and protein needs has been challenged, but few data are available to test the impact of these practices on the diets of lactating women. In the eastern Amazon the immediate postpartum period is referred to as *resguardo*, lasts for 40–41 days and includes food taboos and work restrictions. Taking a biocultural perspective, this paper combines data on the beliefs and attitudes surrounding the practice of *resguardo* with quantitative data on the actual dietary intakes and activity patterns of a cohort of 23 lactating women followed from birth through 15 months postpartum. This paper addresses three topics: (1) shared ideals regarding *resguardo*; (2) adherence to food and work restrictions; and (3) the impact of these practices on women's dietary intakes and energy expenditure. The results show that the majority of women adhered to food taboos and work restrictions. During *resguardo* energy expenditure in physical activity was lower, reducing women's energy needs and allowing them to devote more time to infant care. However, energy intakes were also lower. The reduction in dietary intake was impacted more by work restrictions and the loss of women in subsistence tasks during *resguardo* than by adherence to food taboos. In addition to altering maternal energetic strategies, *resguardo* served an important social function by reinforcing bonds and, for young women, marking the transition to womanhood.

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Childbirth and the immediate postpartum period are events of great biological and social importance in our species. During this time most societies view the mother and neonate as vulnerable. Therefore, women in many societies observe a series of postpartum practices aimed at protecting the mother–infant dyad. A review of the literature, including the Human Relations Area Files (eHRAF), revealed descriptions of postpartum practices in a wide range of human societies in Africa (Brindley, 1985; Roberts, Paul, Cole, & Whitehead, 1982; Spencer, 1988), the Americas (Acosta-Johnson, 1980; Santos-Torres & Vasquez-Guribay,

2003; Tschopik, 1946), Asia (Benedict, 1976; Holroyd, Twinn, & Yim, 2004; Laderman, 1981; Launer, 1993; Manderson, 1981; Scott, 1986; Sich, 1981; Wilson, 1980) and Europe (Bringa, 1995). While practices vary, commonly a period of rest or seclusion is observed in conjunction with food restrictions and limitations on work. Justification for these practices includes maintaining close contact between mother and infant, recuperating from childbirth, and protecting the new mother and child from dangers.

Lactation is the most energetically demanding stage of reproduction, increasing maternal energy needs by 25–30% (Prentice et al., 1996). Postpartum practices can impact how women meet these additional energy demands. Women in many developing countries are actively involved in household food production and thus, must negotiate

* Tel.: +1 614 292 2766; fax: +1 614 292 4155.

E-mail address: piperata.1@osu.edu

their roles as both producers and reproducers (Lukmanji, 1992). The way in which women cope with these sometimes conflicting demands and the implications women's strategies have on household food production and child nutrition have received attention in both the academic and development literature (Lado, 1992; Wandel & Holmboe-Ottesen, 1992; World Bank, 1988).

Cultural practices, such as food sharing and beliefs regarding appropriate physical activities, can mediate the energy demands of lactation. While some studies have mentioned practices that have the potential to reduce activity levels (Acosta-Johnson, 1980; Bringa, 1995; Jimenez & Newton, 1979; Launer, 1993; Manderson, 1981; Messer, 1981; Roberts et al., 1982; Wilson, 1980), only two have documented such reductions (Launer, 1993; Roberts et al., 1982). Other practices, such as food avoidance, could make it more difficult for lactating women to meet their additional energy and protein needs. Studies of postpartum practices have focused on food taboos and the rationality of food avoidance during reproduction, when women's energy and protein needs are higher, has been questioned (Aunger, 1994; Bolton, 1972; Ferro-Luzzi, 1980a, 1980b; Holroyd et al., 2004; Laderman, 1981; Manderson, 1981; Messer, 1981; Ogbeide, 1974; Santos-Torres & Vasquez-Guribay, 2003; Scott, 1986; Sich, 1981; Spielmann, 1989; Trant, 1954; Wiese, 1976; Wilson, 1980). Unfortunately, few studies have collected the necessary data to examine the impact of food taboos on dietary intakes and none have considered dietary restrictions in light of other postpartum practices such as reductions in activity patterns leading Harris (1987) to challenge the assumption that food taboos during reproduction compromise maternal intakes.

This paper reports on the practice of *resguardo*, a 40–41-day postpartum period observed by *Ribeirinha* women in the eastern Amazon. This paper addresses three main questions about *resguardo*: (1) what are the shared expectations and explanations regarding the practice? (2) To what extent do women adhere to food taboos and work restrictions? And (3) how are maternal dietary intakes and energy expenditures affected?

Background

The study area consisted of seven, riverine communities located around the Caxiuanã National Forest in the eastern Amazonian state of Pará (Fig. 1). Homes were small, wooden structures without running water or electricity. Most households consisted of a nuclear family. The people were of mixed ethnicity (indigenous Amazonian/Portuguese/African) and self-identified as *Ribeirinhos*, the largest ethnic group occupying the Amazon Basin. All practiced subsistence horticulture with bitter manioc (*Manihot esculenta* Cranz) as the dietary staple supplemented by fish and game meat as the primary sources of protein (Piperata & Dufour, 2007). Manioc was consumed primarily in the form of *farinha*, a toasted meal. *Açai* (*Euterpe oleracea*), a palm fruit was an important source of both calories and fat (Piperata & Dufour, 2007).

There was a well-defined sexual division of labor. Men conducted most of the fishing and almost all of the hunting

and commonly collected *açai*. Both men and women worked together in the manioc gardens. Once the roots were transported to the manioc processing huts, women and children often did the processing while men went fishing or hunting. All housework, food preparation, including the processing of *açai*, and childcare were considered women's work.

All families participated in the market economy primarily through the barter of *farinha* for industrialized products such as sugar, coffee, cooking oil, salt, soap, motor oil, beans, rice and clothing. An additional source of income for some families was the participation of adolescent and adult males in wage labor jobs, either in small-scale timber extraction or as maintenance personnel at the Emílio Goeldi scientific station (ECFPn) located in the area.

Resguardo

While specific diet and work restrictions vary between populations living in different geographic regions, the logic behind and practice of *resguardo* is similar throughout Brazil including in the Amazon (Begossi & Braga, 1992; Murrieta, 2001; Wagley, 1964), among coastal fishing populations in the north (Maués & Motta-Maués, 1978; Motta-Maués, 1993), south (Hanazaki, Freitas Leitão-Filho, & Begossi, 1996), and northeast (Scheper-Hughes, 1985), as well as among Afro-Brazilians in southern Brazil. The practices that characterize *resguardo* in Brazil are similar to those observed by women in other Latin American countries including Colombia (Dufour, personal communication) and Mexico (Foster, 1994; Santos-Torres & Vasquez-Guribay, 2003) and are based in humoral medical theory, introduced to the Americas by Europeans during colonization (Foster, 1994).

The term *resguardo* comes from the Portuguese verb *resguardar*, meaning to protect. For the people in this study, *resguardo* was observed by people who were injured, ill and also by women after childbirth when they were seen as *aberta* [open] and therefore vulnerable. *Resguardo* lasted for 40–41 days, depending on the sex of the infant, during which time women observed food taboos and work restrictions and avoided the river and the forest.

Methods

Study design

The data presented in this paper were collected as part of a longitudinal study on the energetics (diet, energy expenditure and body composition) of lactation among *Ribeirinha* women (Piperata & Dufour, 2007). The data were collected over a 22-month period when I lived in the communities. All women in their third trimester of pregnancy who lived within 15 miles (i.e., 1 h by speedboat) of the scientific station (ECFPn) were invited to join the study. A total of 27 women were identified; however, some could not participate leading to a final sample of 23 women. General characteristics of these women are given in Table 1. For each woman, quantitative and qualitative data on dietary intake and energy expenditure were collected on 3 consecutive days in each of three postpartum

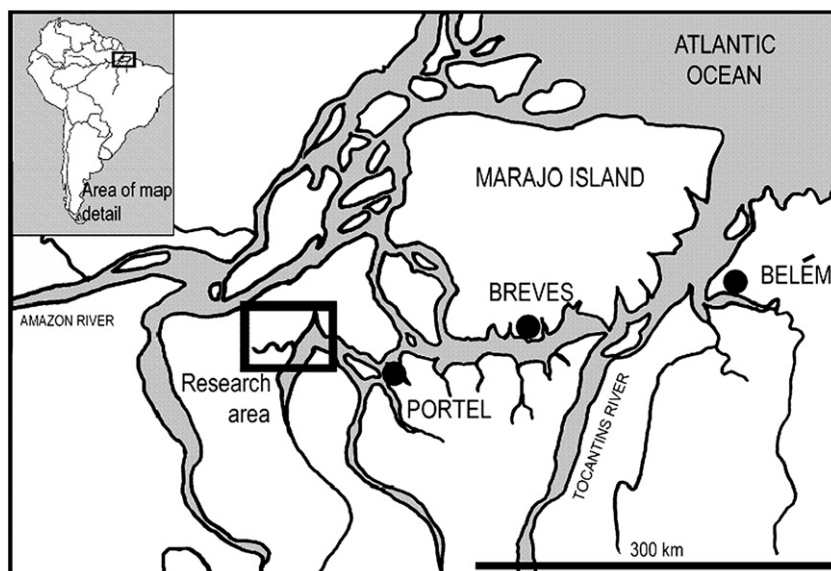


Fig. 1. Location of field site.

periods. The first measurement period took place during *resguardo* (3.2 ± 1.6 weeks), the second during peak lactation (10.5 ± 1.7 weeks) and the third during late lactation (64.7 ± 3.4 weeks), which was close to the time of weaning. For this paper, data from peak and late lactation are combined and referred to as the “non-restricted” period.

Structured and semi-structured interviews with adult men and women were used to gather information on the cultural ideals surrounding the practice of *resguardo* and the classification of restricted foods and activities. All data collection methods were reviewed and approved by the Human Research Committee at the University of Colorado, Boulder (HRC #1001.2), the *Comite de Ética* at the *Universidade de São Paulo*, Brazil and the *Conselho Nacional*

de Desenvolvimento Científico e Tecnológico (CNPq), Brasília, Brazil.

Data collection

Ethnographic data

Over the 22-month study, I used participant observation and unstructured interviews to collect contextual data on the practice of *resguardo*. While accompanying the 23 lactating women, I collected data on their actual behaviors and those of others in the household (documenting support, advice, help, etc.). During this same period, I used informal interviews to help clarify behaviors/practices whose purpose was not clear. The considerable time I spent

Table 1

Characteristics of participants in the study

	Lactating women (n = 23)	Food taboo interviewees (n = 45)	Cultural ideals during <i>resguardo</i> interviewees (n = 46)
Females			
n	23	13	26
Age (years), mean (range)	27 (15–42)	45 (34–59)	34 (17–59)
Parity, mean (range)	5.6 (1–15)	9.3 (4–13)	7 (1–13)
Household size, mean (range)	8.8 (5–15)	8.0 (2–13)	7.4 (2–15)
% Involved in wage labor	4	0	0
Height (cm), mean \pm SD	149.6 \pm 3.4	145.2 \pm 5.0	147.3 \pm 5.2
Weight (kg), mean \pm SD	50.5 \pm 7.4	53.5 \pm 4.2	49.6 \pm 4.4
Males			
n	–	32	24
Age, mean (range)	–	39 (19–77)	35 (19–66)
Parity, mean (range) ^a	–	6.3 (1–13)	6.0 (1–13)
Household size, mean (range)	–	8.4 (2–14)	7.2
% Involved in wage labor	–	30	19
Height (cm), mean \pm SD	–	160.4 \pm 5.4	160.8 \pm 6.1
Weight (kg), mean \pm SD	–	62.1 \pm 10.2	61.0 \pm 8.9

^a Value = parity of their wives.

living in the communities provided plentiful opportunities to observe and talk with community members about their lives and beliefs.

Dietary intake

For each woman in each postpartum period I collected quantitative and qualitative data on her dietary intake on 3 consecutive days using the weighed inventory method (Gibson, 1990). During each day, I weighed everything the woman ate, documented the recipes of all prepared foods and subtracted any unconsumed portions. The total number of consumed items that I recorded over the course of the study was 1800. With these data and food composition tables (Franco, 2003; FAO food composition table for Latin American Foods) I used nutritional analysis software (Nutribase) to calculate the energy and macronutrient composition of all foods consumed. Average daily energy (kcal) and protein (g) consumption during *resguardo* and the non-restricted period were calculated for each woman. The energy and protein requirements of lactation are calculated based on the FAO/WHO/UNU (1985) recommendations.

Energy expenditure

On the same days I recorded the dietary data, I maintained continuous activity diaries which included the type and duration of activities, as well as the woman's body position. Over the course of this study I logged a total of 17,225 entries in the activity diaries. Using published values of the energy expenditure of different activities (Ainsworth et al., 1993; Dufour, 1984; FAO/WHO/UNU, 1985; James & Schofield, 1990), these diaries were used to calculate maternal energy expenditure. The average daily period of observation during *resguardo* and the non-restricted period was 9.4 ± 0.5 and 9.6 ± 0.7 h/day, respectively. Basal metabolic rate (BMR) of each woman was estimated using the equations of Henry and Rees (1991). Daily energy expenditure, for each woman, during *resguardo* and the non-restricted period was calculated. The averages were used in all data analyses.

Interviews

In order to gather information on the food taboos, work restrictions, as well as general beliefs and ideals regarding *resguardo*, I conducted three separate interviews. For the first interview four adult males and two adult, non-lactating females were approached and asked to free list all the fish, game and fruit species in the diet. I combined these six lists to create a master list, which included 70 fish, 61 game and 57 fruit ethno-species which was then used to conduct structured interviews on food taboos with a separate sample of 32 men and 13 non-lactating women. For each item on the list subjects were asked if it was taboo during *resguardo* "yes" or "no." I also recorded information on why foods were classified as taboo. Taboo species are defined as those classified as taboo by $\geq 50\%$ of the 45 interviewees.

The third interview was semi-structured and was aimed at understanding ideals regarding the practice of *resguardo*. I interviewed a total of 24 adult, married men and 26 adult, married women. The interview topics included the duration of *resguardo*, food taboos, work restrictions, and

geographic restrictions. The consequences of disobeying these norms were discussed, as were expectations regarding helpers and the tasks they were expected to perform. All interviews were audio-recorded and later transcribed. Restricted activities are defined as those mentioned by the majority ($\geq 50\%$) of the 50 interviewees. General characteristics of the interviewees are in Table 1.

Data analysis

Data were analyzed to address the three research questions. Information and quotes from the 50 semi-structured interviews are used to present emic data on the practice of *resguardo* including explanations for the practices and the risks associated with their violation. To determine adherence to food taboos during *resguardo*, the actual intakes of the individual women are compared to the list of foods classified as taboo by 50% or more of interviewees. For adherence to work restrictions, the activities the individual women performed during *resguardo* are compared to the list of activities classified as restricted by 50% or more of interviewees. Paired Student's *t*-tests were used to identify differences in dietary intake and energy expenditure between *resguardo* and the non-restricted period. In addition, the kcal and protein contributions of taboo foods to the diet and the energy expended in restricted activities during both *resguardo* and the non-restricted period were calculated and compared. Significance was set at 0.05 and SPSS (v. 14.0) was used to conduct all statistical analyses. Pseudonyms are used to preserve anonymity of participants, *Dona* is the equivalent of Mrs. and *Seu* is equivalent to Mr.

Results

All women in the seven communities reported observing *resguardo* after childbirth. For all, *resguardo* began immediately after birth and lasted for 40 days when the infant was a girl and 41 days when it was a boy. Although most women could not explain why the length of *resguardo* differed based on sex, some of the older, more experienced women responded by saying "the boy pulls more" meaning the boy places more strain on the mother. As *Dona Rosa* explained:

The boy breastfeeds with more effort, he has a force! And the girl does not, she breastfeeds like this [she demonstrates], slow. The girl is calm. It is the same with the pain of childbirth the boy is different from the girl. The pain with a girl is less. With a boy it is an incredible pain. I had two boys and they hurt much more than the girls, its true.

Here *Dona Rosa* expresses the idea that a male infant puts more pressure on the woman's body both in terms of breastfeeding style and by causing greater pain and hardship during parturition. The implication is that women require more time to recuperate after the birth of a boy. The extra day appears to be symbolic of this increased effort.

In general, the people recognize three stages of *resguardo*: (1) birth to 7–8 days after birth; (2) end of the first week to the healing of the navel; (3) the period from the time the navel heals to day 40–41. Each stage

was associated with specific dietary practices and work restrictions, with a general relaxation of prohibitions over time. During the first week women were not expected to leave their hammocks and the ideal diet was boiled chicken. However, few families had many chickens and several men expressed anxiety over not having enough to provide their wives with this ideal food for an entire week. During this week women received the most social support which came from the *parteira* [midwife] and female relatives, especially the woman's mother and mother-in-law. Some women traveled long distances to stay with their daughters during *resguardo*. The date that marked the termination of *resguardo* was typically well known in the community.

Food restrictions

Cultural ideals

During structured interviews, study participants were asked to define *resguardo*. The majority of the time they answered by talking about food taboos, indicating that dietary prohibitions played a central role in the practice of *resguardo*. Indeed, some people referred to the period of *resguardo* as a *dieta* [diet], which again emphasized the focus on food taboos. In many parts of Brazil, people classify food into two broad categories *manso* [safe, harmless] and *reimoso* [taboo] (Maués & Motta-Maués, 1978; Murrieta, 2001). When I asked Dona Rosa "what is *resguardo*" she responded "For me *resguardo* is avoiding *reimoso* foods." Dona Letícia expressed similar sentiments:

Because a woman, when she has a new baby many times she eats a food, and it makes her sick. I did not eat certain types of food that my mother did not let me eat. My food was all selected.

While men shared some of this knowledge of food taboos, it was clearly a woman's domain and men often said that they learned the food taboo system from their observations and experiences providing for their mothers and wives during *resguardo*.

The number of prohibited foods declined over the course of *resguardo* and was greatest between birth and the healing of the infant's navel. The violation of food taboos at this stage of lactation was thought to have greater consequences for the infant than the mother. For example, Dona Marta explained:

It is when the umbilical cord is open that the mother cannot eat taboo foods because it can cause an injury in the child, it could bleed and the child could die.

This belief that what the mother eats can harm the infant was common, although people who had spent more time in rural towns tended to express doubts about it. However, due to their distance from any type of medical assistance, they preferred to err on the side of caution.

The foods most commonly classified as taboo were certain fish, monkeys, tapir, caiman, some turtles, wild pigs and numerous fruits. Most people were unable to explain why a particular food was taboo and when asked would respond by simply saying *faz mal* [it makes you sick]. However older men and women were often able to

specify the characteristics of a food that made it taboo and the consequences of eating it. The most often mentioned characteristics of taboo fruits were their acidity and fattiness. For fish and game meat, the most often cited criteria were the lack of scales (skin fish), color of the animal (red), the color of its flesh (dark), or its behavior. Animals that gnawed, or were seen as *braba* [aggressive] or dangerous (like a sting ray) were considered taboo.

Seu Roberto explained why an animal's behavior, specifically gnawing, makes its flesh taboo.

Because, as I understand it, just as he is damned to gnaw what it eats, it is also going to make your wound itch. It bleeds, in the same way as if you cut yourself or when an animal bit you.

Structured interviews showed that 41 species were classified by 50% or more of the people as *reimoso* (19 fish, 19 game, 3 fruits). The interviews also revealed that the taboo status of foods was not unanimous. When I inquired why, older men and women explained that despite general guidelines, each person was different and that what was taboo for one may not be for another. Great precaution was taken with the first child, anything a woman ate that did not make her sick or impede her or her infant's healing was considered safe to eat with subsequent children.

Adherence to food taboos

Over the 69 days of observation during *resguardo* and 128 days of observation during the non-restricted period I logged the consumption of 518 and 1282 dietary items, respectively. Table 2 lists the species of taboo fish, game and fruit that were consumed at least once during either period. Table 2 also reports the number of women who consumed each species and the number of times each of the species was consumed during *resguardo* and the non-restricted period. Four of the 23 women violated food taboos during *resguardo*, which included three fish and one game species. No taboo fruits were consumed during *resguardo*. One woman ate two different taboo species (*cabeçuda* and *amani*). The other three ate only one species each. However one woman consumed the same species (*amani*) six times over the 3-day period of observation. Together this amounts to 11 violations, which account for 2.1% (11/518) of all items consumed. During the non-restricted period, 17 of the women, nine on multiple occasions, consumed species considered taboo during *resguardo* including seven species of fish, four species of game and one species of fruit (Table 2). Taken together, these species were eaten 52 times over the 128 days of observation and accounted for 4.0% (52/1282) of all items consumed during the non-restricted period.

Impact of food taboos on energy and protein intakes

Overall, the diets of those lactating women were 73% carbohydrate (*farinha*, *açai*, rice, sugar), 12% protein (fish, game, beans) and 15% fat (*açai*, fish) (Piperata & Dufour, 2007). Average energy intake was significantly ($p < 0.01$) lower during *resguardo* (1385 ± 268) compared to the non-restricted period (1786 ± 564). Average protein intakes were close to protein needs in both periods but significantly higher ($p = 0.05$) during *resguardo* (52 ± 14)

Table 2
Taboo species consumed during the study

Taboo species	Scientific name	Resguardo ^a		Non-restricted period ^b	
		No. of women who consumed taboo food	No. of times taboo food was consumed	No. of women who consumed taboo food	No. of times taboo food was consumed
Fish					
Piranha preta	<i>Serrasalmus rhombeus</i>	0	0	2	3
Surubim	<i>Pseudoplatystoma fasciatum</i>	0	0	1	3
Mapara	<i>Hypophthalmus</i> spp.	0	0	3	8
Filhote/Piraiba	<i>Brachyplatystoma filamentosum</i>	1	1	3	4
Cachorro do padre	<i>Acestrorhynchus</i> sp.	0	0	1	2
Aruana	<i>Osteoglossum bicirrhosum</i>	1	2	7	7
Amani/Aracu	<i>Leporinus affinis</i>	2	6	7	8
Game					
Anta	<i>Tapirus terrestris</i>	0	0	1	2
Cabeçuda	(river turtle)	1	2	2	4
Catitu	<i>Tayassu</i> sp.	0	0	2	5
Coati	<i>Nasua nasua</i>	0	0	2	2
Fruit					
Bacaba		0	0	3	4

^a 69 days.

^b 128 days.

compared to the non-restricted period (46 ± 11). Table 3 reports the contribution that taboo foods made to the dietary intakes of these women during *resguardo* and the non-restricted period. During *resguardo*, four women consumed taboo foods. For the group as a whole ($n = 23$), these foods contributed 1% of their total energy and 3% of their total protein intake. During the non-restricted period, 17 of the 23 women consumed foods classified as taboo which, for the group as whole, contributed 3% of total energy and 9% of total protein to the diet.

Activity patterns

Cultural ideals

During *resguardo* women observed work restrictions. Interviews revealed a high level of agreement as to what activities were allowed and which should be avoided. During the first week postpartum women were seen as being especially fragile and spent almost the entire day in a reclined position in their hammocks.

Table 3
Contribution of taboo foods to the individual protein and energy intakes of those who consumed these foods during *resguardo* and the restricted period

Subject no.	Resguardo			Non-restricted period		
	No. of taboo species consumed	kcal (% Total)	Protein (g) (% total)	No. of taboo species consumed	kcal (% Total)	Protein (g) (% total)
1	0	0	0	2	152 (2)	26 (11)
2	0	0	0	1	12 (<1)	1 (<1)
3	0	0	0	0	0	0
4	0	0	0	1	25 (<1)	3 (1)
5	0	0	0	1	169 (1)	24 (7)
6	0	0	0	2	95 (1)	9 (5)
7	1	106 (3)	22 (13)	6	873 (7)	176 (44)
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	1	74 (1)	11 (5)
11 ^a	1	129 (3)	13 (10)	4	678 (8)	83 (25)
12	0	0	0	2	130 (1)	21 (8)
13	0	0	0	1	45 (1)	10 (4)
14	0	0	0	1	74 (<1)	15 (5)
15	0	0	0	1	953 (11)	11 (4)
16	0	0	0	3	618 (5)	70 (21)
17	1	663 (15)	57 (25)	0	0	0
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	0	0	0	2	139 (1)	22 (10)
21	2	200 (5)	37 (19)	4	1139 (9)	54 (16)
22	0	0	0	2	377 (3)	57 (15)
23	0	0	0	1	596 (8)	83 (27)
Average	–	48 (1)	6 (3)	–	267 (3)	29 (9)

^a Percent is calculated based on 2 days of observation during *resguardo*.

According to *Dona Rosa*:

We cannot do anything. One must refrain from activities, one cannot clean the baby's clothes during these eight days. Other people washed them for me...I did not prepare food for myself for lunch. It was others that did that.

After the first week women were expected to resume light, household tasks. As explained by *Dona Noelma*:

After the first few days she can wash the baby's clothes on land, she can make a little food, easy. She cannot fill and transport water, she cannot cut firewood, she cannot carry weight...things in the forest she does not do. She can also not do work in the manioc garden, no heavy work. It is also not good for a woman to sweep the house during *resguardo*.

Conducting physically demanding tasks was believed to threaten a woman's health both in the present, as well as in the future. *Dona Marta* explains the types of work a woman should avoid during *resguardo*, as well as the consequences these activities can have on the woman's health:

Look, heavy work can cause a woman to hemorrhage...she cannot clean a large blanket, a hammock, a sheet, fill and carry water, carry anything heavy, cut firewood, sweep the house...It is because of doing those things that there are women who are sick, who suffer from certain stomach problems, that when they menstruate they aren't well.

I then asked *Dona Marta* to clarify this idea that violations of work restrictions during *resguardo* could cause problems in the future. She responded:

When time has passed, when a woman has reached old age, the sickness can manifest. A problem with my sight, a headache, pain in my hip, a stomach ache, you do not know what it is right? It is because of what you did in *resguardo*. I now suffer from certain problems that I know are due to me not observing *resguardo*. I cut firewood for my stove because no one was around to do it for me. And now I suffer from headaches, a lot of headaches. I have problems with my vision. All of that could be from me not taking care of myself during *resguardo*.

Women often told stories about themselves and others they knew or had heard of who violated these work restrictions and, like *Dona Marta*, many blamed their current health problems on these violations.

In addition to work restrictions, women also observed geographical restrictions and avoided rain, wind, intense sunlight and *sereno* [light mist and cold associated with the early morning]. Women would cover their heads with a kerchief when it was windy and would run for the house if the winds picked-up or it began to rain. *Dona Marta* discussed the fact that she also did not obey all these restrictions and that she currently suffered health problems, which she attributed to those violations.

You cannot be exposed to the rain, or to the *sereno*, you cannot get a lot of sun, it gives you a headache, colic, eye pain, sneezes, this is all a problem of *resguardo*. It causes toothaches. I exposed myself to the rain, I exposed

myself to the sun, I exposed myself to the *sereno*. That day I did not feel anything, but now I am feeling it.

During *resguardo* women were not supposed to enter the river for any reason (bathing, fishing, washing clothes, canoeing, etc.) or walk too far into the forest due to the dangers certain forest and river animals posed (evil eye) to a woman and her newborn. The general expectation was that women would stay close to or inside their home for the entire 40–41-day period.

While there was some debate regarding the dangers a woman faced in the forest, there was almost unanimous agreement regarding the dangers of entering the river. Almost all made reference to an animal that could harm the woman, generally referred to as *um bicho do fundo* [animal of the deep], but many specifically mentioned the river dolphin (*Inia geoffrensis*). *Dona Marta* explains:

Look, for one thing, she is obeying *resguardo*, right. She cannot enter the water, go under the water, she cannot row a canoe, she cannot fish,...because the things of the deep can make one sick. Look, you know what I have fear of in the river, that can make a person sick during *resguardo*? It is the dolphin. He can turn into other things and cause bad things to happen to a person. He can want to do other things with a woman. To play the part of a man, because the dolphin, he can turn into a person! He can leave the water.

During *resguardo*, women were seen as more vulnerable to these dangers but it was recognized that any person was susceptible to the evil eye and to the seduction of the river dolphin.

Adherence to work restrictions

Table 4 lists the activities that were mentioned as restricted by 50% or more of the interviewees and which were conducted at least once during the course of the study. As seen in Table 4, none of the women conducted any subsistence work during *resguardo* including garden work (weeding, planting, harvesting manioc roots, hauling roots) and the processing of manioc roots into *farinha* (soaking, peeling and grating roots, dewatering and toasting *farinha*). One woman was observed processing *açai*, also a restricted activity, but in this case she was assisting her daughter who did the more energetically demanding tasks. None of the women fished during *resguardo*. In terms of housework, however, numerous women conducted restricted activities, especially sweeping ($n = 15$). Of the 3803 activities logged during *resguardo* 126 (3%) were considered restricted activities while 2859 of the 13,366 (21%) activities performed during the non-restricted period were classified as restricted.

Impact of work restrictions on energy expenditure

Average energy expenditure, excluding the additional theoretical costs of lactation, was 1441.5 ± 172.5 kcal during *resguardo* compared to 1786 ± 200 kcal during the non-restricted period ($p < 0.01$). The observed increase in energy expenditure was due to increased participation in subsistence-related, higher energy expenditure tasks, all of which were avoided during *resguardo*. During *resguardo*

Table 4
Restricted activities conducted during the study

Activity	Resguardo ^a			Non-restricted ^b		
	No. of women who conducted activity	No. of times activity was conducted	% Time	No. of women who conducted activity	No. of times activity was conducted	% Time
Housework						
Sweeping	15	57	0.7	23	199	0.7
Hauling water	8	57	0.3	23	622	1.3
Scrubbing floor	3	4	0.2	12	34	0.2
Washing hammock	0	0	0.0	2	14	0.1
Cutting firewood	3	4	0.03	15	142	0.7
Subsistence work						
Fishing	0	0	0.0	2	3	0.2
Garden work	0	0	0.0	11	207	3.9
Manioc processing	0	0	0.0	15	906	8.7
Making açai	1	1	0.1	13	318	1.2
Paddling canoe	1	3	0.02	10	76	0.7
% Total time			1.4			17.7
% Total kcal expended			2.0			25.0

^a 69 days; $n = 23$; average (\pm SD) number of hours observed per day = 9.4 ± 0.5 .

^b 128 days; $n = 23$; average (\pm SD) number of hours observed per day = 9.6 ± 0.7 .

the women spent an average of 1.4% of their time conducting restricted activities, which is far less than the amount of time they spent conducting these same activities during the non-restricted period (18%). The percent of total energy expended in restricted activities during *resguardo* was only 2% (~ 29 kcal/day) compared with 25% (~ 437 kcal/day) during the non-restricted period (Table 4).

Discussion

In these rural communities, people held a common belief that women and infants were vulnerable during the immediate postpartum and all women observed the postpartum practice of *resguardo*. Adherence to the prescribed food and work restrictions was very high. The rarity of taboo foods in the diet, especially during the non-restricted period, suggests that their avoidance during *resguardo* did not comprise the dietary intakes of lactating women. In fact, some of the species most often categorized as taboo, including sting rays (*Potamotrygon* sp.), *jacunda piranga* (*Crenicichla lugubris*), capuchin monkeys (*Cebus pallata*), coati (*Nasua nasua*) and *cupuaçu* (*Theobroma grandiflorum*), were never consumed by any of the women during the course of the study. The most important sources of calories (64%), *farinha* and *açai*, were never classified as taboo and commonly consumed fish (*Cichla* sp., *Geophagus surinamensis*, *Hoplias malabaricus*) and game (*Cuniculus paca*) were rarely classified as taboo. The data from this current study show that, for the group, taboo foods made a minimal contribution to the energy and protein intakes of lactating women both during and outside the restricted period. Therefore, the avoidance of taboo foods was not the primary cause of the low energy intakes observed during *resguardo*. One interesting observation is that three of the four women (subjects 11, 17 and 21) who violated the food taboos had spent a significant amount of time living in Portel, the town closest (~ 10 h) to these communities. In general, they exhibited less knowledge and greater skepticism regarding the rules of *resguardo*.

While there were some violations of work restrictions, most were household tasks including sweeping and hauling small buckets of water from the river's edge. None of the women conducted subsistence activities during *resguardo*, which were doubly restricted due to their associated energy demands and the fact that most took place in locations that were classified as dangerous, including the forest and river. Energy expenditure was lowest in *resguardo* and the data show that participation in subsistence activities increased energy expenditure during the non-restricted period. Therefore, the observance of work restrictions played a positive role in reducing women's energy needs during the early postpartum. However, instead of being closer to energy balance, none of the women met their energy needs during *resguardo* because the reduced energy expenditure was accompanied by reduced energy intake. This appears to be due to the sexual division of labor and the inability of men to meet household subsistence needs without the help of their wives. While men and women often shared gardening work, including the planting and weeding of their plots and the harvest and transport of manioc roots, women and children did the processing. The fact that manioc processing was where women made their greatest contribution to household food production can be viewed as a strategy to balance their roles as both food producers and reproducers since the huts were located close to the home and the work allowed women to periodically stop and care for children, including breastfeed. As women and children processed the dietary staple, men commonly went fishing and hunting. During *resguardo*, with their wives excluded from subsistence work, men were responsible for both the dietary staple and protein capture and, in keeping with the sexual division of labor, tended to focus on their fishing and hunting activities. The fact that men were expected to provide their wives with non-taboo protein sources during *resguardo* and that those who did not fulfill this role were often ridiculed also influenced their time allocation decisions. As has been noted among other populations, when

laborers are limited it is more common for women to assume the responsibility of traditionally male activities than *vice versa* (Lado, 1992). *Açai*, an important source of energy in the local diet, was only consumed by one woman during *resguardo*, not because it was considered taboo but because the extraction of the juice was considered women's work and, being strenuous, was restricted during *resguardo*. Men were never observed processing *açai*, making this resource unavailable during *resguardo*. Thus, the loss of the female head from food production and maintenance of gender roles in the division of labor resulted in higher protein but lower overall energy intakes.

Resguardo: status change and social significance

Since the dietary and energy expenditure data indicate that *resguardo* did not have a positive impact on maternal nutrition, it is worth asking why people continue to observe this traditional practice. One reason may be its social significance. Life in these Amazonian communities was relatively monotonous. Women's work was particularly monotonous since they did little of the fishing and none of the hunting and spent most of their days in and around their home, in many cases with only their small children as company. Their work was also never-ending as they helped their husbands in subsistence work and had the sole responsibility of childcare and maintaining the home. In communities where homes were scattered along the river's edge, occasional trips to neighbor's homes were made by dugout canoe, although these visits were much more common for men than women. There were few celebrations making those that did occur, typically birthday parties, highly anticipated and attended events.

In such a setting, a practice that places women at the center of attention, relieves them of almost all responsibility and celebrates their role as mothers can be highly significant in their lives. For these 40–41 days, the daily routine was changed dramatically. Men were expected to care for their wives, provide them with non-taboo foods and help with housework and childcare, which they rarely assisted in outside *resguardo*. Women often received visitors over this 40-day period, including their mothers who commonly spent the first week living with and helping their daughters with housework and childcare. Other family members also helped, including mothers and sisters-in-law—even friends contributed. The new mother's health and the infant's development were carefully monitored during these 40–41 days. While those interviewed emphasized a woman's vulnerability during the immediate postpartum as the justification for the practice of *resguardo*, few of the lactating women ever expressed feeling weak or vulnerable and thus requiring assistance or protection. Instead, what women seemed to value were their status change, the attention they received and the alterations to their daily routine. For young women, the observance of their first *resguardo* was highly significant as it marked their transition from being *meninas* [girls] to being women and was recognized by everyone, including their parents. As new mothers, they were relieved of caring for their younger siblings, which was time consuming and often underappreciated, and were no longer expected to take orders

from other family members. I observed this status shift in several households. *Dona Regina*, referring to her daughter (subject 19), told me “Now she is a woman. She has her own house, she cares for her own husband and child. She can still help us but her responsibility is to them.” Subject 14 was married to an older man who had lost his first wife during the birth of their 12th child. During *resguardo* her house was always full of visitors, especially her husband's older, married children, and she received a lot of social support. She told me

“This is a happy house. People are here all day. Socorro (step-daughter) brought guavas, everyone is eating guavas. My neighbor was here yesterday to see the baby. My daughter is helping me. She makes me milk and helps with the children so I can take care of the baby.”

Their husbands' efforts to provide proper food, the doting of their mothers and other female relatives on both them and their children and the concern and company of friends seemed to solidify social bonds that women reciprocated when a family member or friend gave birth. Many women expressed reluctance about the inevitable end of *resguardo* and for those who did not receive the expected support this period seemed to be a time of sadness, anxiety and depression.

Conclusion

The goal of this study was to provide a more holistic perspective of the postpartum practices of rural horticultural women in the Amazon and to consider the impact of these practices on their diets and work patterns. To achieve this goal, the paper incorporates an emic perspective, which allows for a fuller understanding of why people adhere to such practices, coupled with systematic observations of the actual practices both during and outside the restricted period.

During *resguardo* these women observed both food taboos and work restrictions. Foods considered taboo were indeed avoided and dietary intake was reduced. However, the taboo foods made little contribution to the diet as a whole and had a small impact on the women's energy intake. Much greater was the reduction in energy expenditure resulting from work restrictions. However, despite a decrease in energy expenditure, the restrictions on subsistence activities had the additional effect of reducing energy availability from important food sources. As a result, women were furthest from energy balance during *resguardo*. Like women in other subsistence-based societies, these *Ribeirinha* women made significant contributions to household food production, especially by processing manioc and *açai*. Men, whether through an unwillingness to cross gendered labor lines or an inability, from lack of time or knowledge, to perform certain tasks were unable to make up for their lost labor during *resguardo*. The fact that the practice of *resguardo* continues, even though it does not have a positive effect on maternal nutrition, is likely due to the social role it plays in women's lives and the fact that it allowed women to spend more time on infant care. The data presented here illustrate the

necessity of considering the entire suite of practices that women observe during the postpartum, work restrictions in addition to food taboos, the need for quantification of dietary intake and energy expenditure, and the importance of ethnographic data for understanding their significance.

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