

Question 2

**PER CAPITA PRODUCTION OF STAPLE FOOD CROPS
IN HEARTH-OF-DOMESTICATION COUNTRIES**

Country	Corn (maize) (pounds per capita)	Potato (pounds per capita)	Rice (pounds per capita)	Yam (pounds per capita)	Cassava (manioc or yuca) (pounds per capita)
	Hearth: Mexico	Hearth: Peru	Hearths: China and Mali	Hearth: Niger River basin	Hearth: Amazon River basin
Brazil	1,056	39	108	3	183
China	412	145	333	0	52
Mexico	471	31	4	0	0
Nigeria	121	15	93	549	618
Peru	107	362	216	0	13

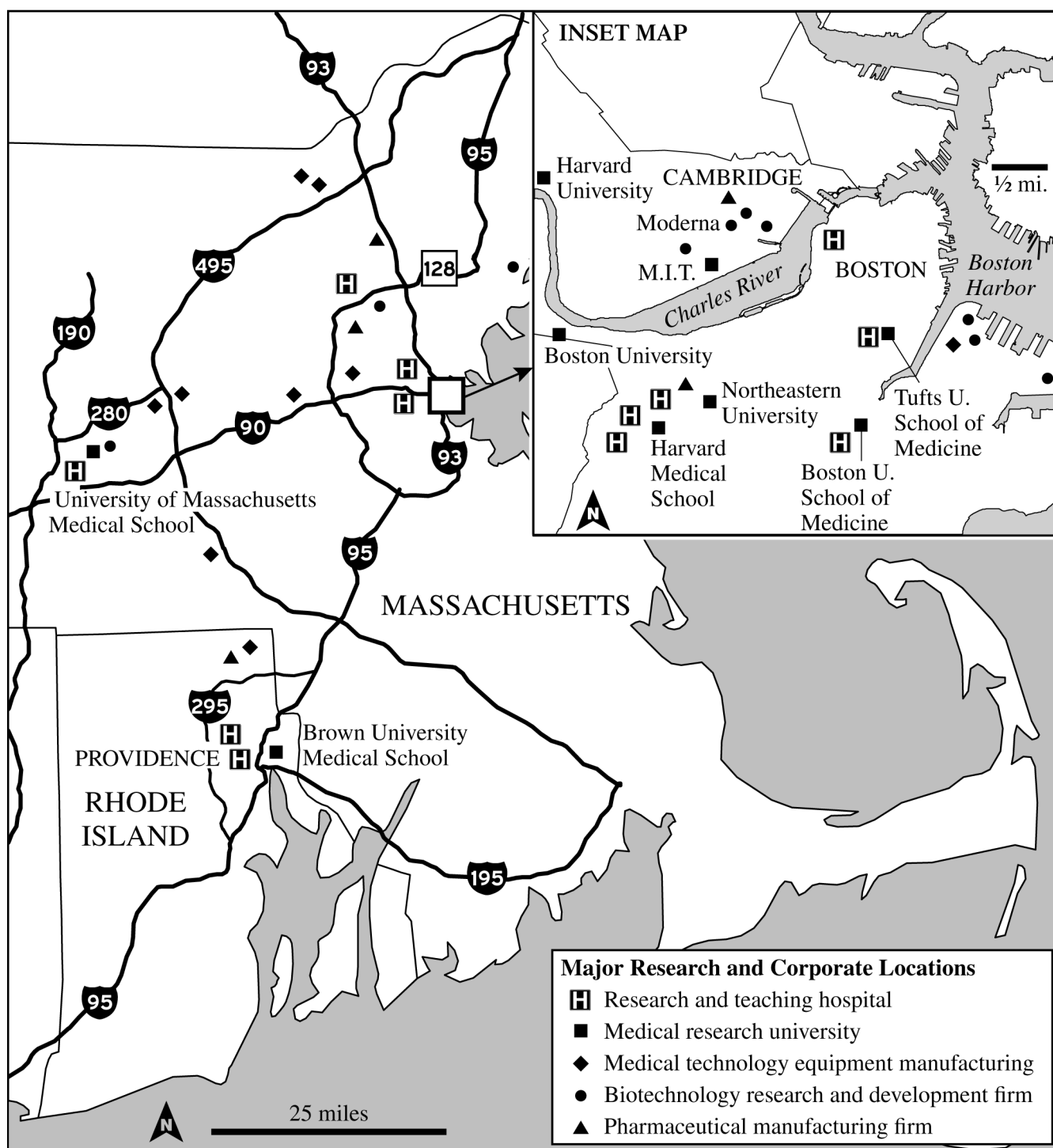
Source: Food and Agriculture Organization of the United Nations

2. Staple food crops provide most of the carbohydrates in people's diets, and some staples are also used as animal feed or in the distillation of ethanol. Cassava is a root crop (tuber) that is the source of farinha, tapioca, and the pearls in bubble tea.
- Describe the concept of an early hearth of domestication.
 - Identify the crop listed in the table that has diffused the least from its hearth of domestication to the countries listed in the table.
 - Explain how food preferences can be a culture trait.
 - Explain how the Columbian Exchange contributed to a crop's diffusion beyond its hearth of domestication.
 - Explain how the data in the table support the concept of a crop's consumption pattern being the result of globalization.
 - Explain why a crop may be farmed intensively in a less developed country and be farmed extensively in a more developed country.
 - Explain ONE way the global supply chain links crops such as those listed in the table to consumers in other countries.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

Question 3

MAJOR MEDICAL AND BIOTECHNOLOGY COMPANIES AND INSTITUTIONS IN THE BOSTON AND PROVIDENCE REGION



Source: National Institutes of Health

The inset map shows the downtown areas of Boston and Cambridge, Massachusetts.

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Question 2: One Stimulus**7 points**

(A) Describe the concept of an early hearth of domestication.**1 point**

Accept one of the following:

- A1. A location where new practices develop and/or from which new practices spread.
- A2. A location where a particular type of plant or animal was first domesticated.
- A3. Locations where early civilizations domesticated plants or animals (e.g., Fertile Crescent, Indus River Valley, Southeast Asia, China, Andean Highlands, Amazonia, and/or Central America).
- A4. An ancient civilization whose farmers converted wild plants or animals into farmable and/or domesticated varieties over time.
- A5. A region (e.g., river valley) where a common wild plant or animal was cultivated into a farmable variant through selective breeding.

(B) Identify the crop listed in the table that has diffused the least from its hearth of domestication to the countries listed in the table.**1 point**

Accept the following:

- B1. Yams diffused the least.

(C) Explain how food preferences can be a culture trait.**1 point**

Accept one of the following:

- C1. Many foods have distinct characteristics (e.g., ingredients, preparations) that are indicative of a specific culture group.
 - C2. Many culture groups identify with one or more national dishes that represent the typical food culture of a society.
 - C3. Many foods contain an ingredient or crop that is local to the region inhabited by a culture group.
 - C4. Many foods are part of a way of life, and/or are forbidden for a group of people, as represented in the belief systems, religion, tools, material goods (artifacts), calendars, and/or holidays of a culture.
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(D)	Explain how the Columbian Exchange contributed to a crop’s diffusion beyond its hearth of domestication.	1 point
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Accept one of the following:

- D1. The Columbian Exchange led to the relocation or movement of crops from one part of the world to another part of the world through conquest, ecological imperialism, colonization processes, and/or along trade routes.
- D2. The Columbian Exchange was a process by which crops moved from one part of the world to another part of the world because of changing food preferences, cultural assimilation, and/or changing agricultural practices.
- D3. The Columbian Exchange may have accidentally or unintentionally introduced a new crop beyond its hearth of domestication (e.g., seeds or plants that may have been “stow-aways” in containers).

(E)	Explain how the data in the table support the concept of a crop’s consumption pattern being the result of globalization.	1 point
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Accept one of the following:

- E1. The high per capita production of corn, potatoes, rice, and/or cassava in locations far from the hearth (e.g., Brazil produces 1,056 pounds of corn per capita) supports the idea of this crop being a globalized crop.
 - E2. The high consumption of corn, potatoes, rice, and/or cassava in locations far from the hearth (e.g., rice consumed outside of China) supports the idea of this crop being a globalized crop.
 - E3. Globalized food culture, popularized food culture, global media coverage of food, and/or globalized consumer food preferences can be represented in the data where a crop is commonly produced away from its hearth of domestication.
 - E4. Globalized populations, multicultural societies, global migration patterns, and/or cultural syncretism can be represented in the data where a crop is commonly produced away from its hearth of domestication.
 - E5. Globalized trade and transportation facilitated by free-trade policies, neoliberal policies, complementarity, comparative advantage, competitive advantage, containerization, and/or bulk rail and ship transport can be represented in the data where a crop is commonly produced away from its hearth of domestication.
 - E6. A globalized economy, increases in economic development, and/or the growth of a global middle class of consumers can be represented in the data where a crop is commonly produced away from its hearth of domestication.
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| (F) | Explain why a crop may be farmed intensively in a less developed country and be farmed extensively in a more developed country. | 1 point |
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Accept one of the following:

- F1. Subsistence or intensive farming of a staple crop in less developed countries may be done on small farm plots used to feed a household, whereas extensive or commercial farming in more developed countries would be practiced on large farms for a company's consumers.
- F2. Some farming of staple crops in less developed countries is based on intensive manual labor (e.g., using hand tools, animal power), whereas most farming in more developed countries is mechanized and/or uses limited human or animal labor inputs and is extensive.
- F3. Farmers in less developed countries may not be able to afford or have access to the investment capital, labor-saving equipment, seed supplies, and/or agricultural chemicals needed for extensive farm production, and thus use intensive human labor, whereas farmers in more developed countries tend to have financial resources for investments in extensive farming inputs.
- F4. Many farms in less developed countries use available local resources to feed families or local communities, whereas farms in more developed countries take advantage of economies of scale to produce for large populations.

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| (G) | Explain ONE way the global supply chain links crops such as those listed in the table to consumers in other countries. | 1 point |
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Accept one of the following:

- G1. Crops are transported internationally to consumers, with one of the following steps: storing, processing, packaging, wholesaling, and/or retailing.
- G2. Crop use in the global restaurant and fast-food industries, crops are cultivated and/or processed in one country and are then distributed through supply chains to local restaurants and/or chain restaurants for cooking in another country.
- G3. Due to the increased global consumption of frozen foods, dried foods, canned foods, and/or dehydrated foods, crops can be cultivated and processed into different preserved forms and then distributed to other countries for long-term storage by wholesalers, grocery stores, household consumers, and/or in restaurants until needed for cooking.
- G4. Crops are sent to facilities that process them into other forms (e.g., corn for ethanol, animal feed) which are shipped to wholesalers, retailers, and/or sold to consumers in other countries.

Total for question 2: 7 points