

**Week 3**

# **MICROECONOMIC THEORY**

## **ECON 323 502/503**

Spring 2026

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## Review:

We talked about how to solve utility maximization problems:

The default case: diminishing MRS and smooth preferences,

- On the budget line:  $P_x x + P_y y = I$
- Tangency rule:  $MRS = P_x / P_y$

Other cases: e.g., perfect substitutes, perfect complements, etc.

- Recommend to start with a graph

## Chapter 4. Individual and Market Demand

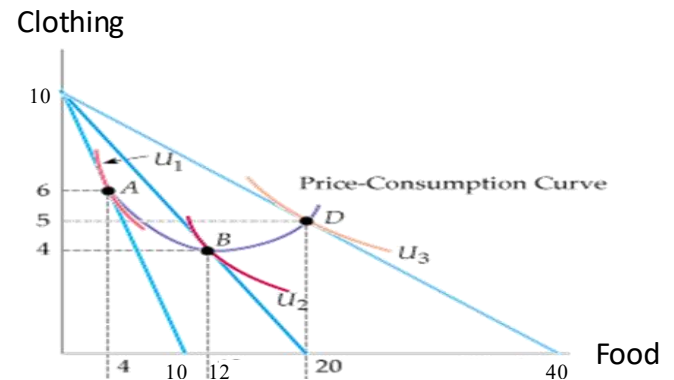
## Related Readings:

- Chapter 4.1 Individual Demand
- Chapter 4.2 Income and Substitution Effect
- Chapter 4.3 Market Demand
- Chapter 4.4 Consumer Surplus

## 4. Individual Demand: Price Changes

The demand curve of an agent follows from the consumption choices a person faces when faced with a budget constraint.

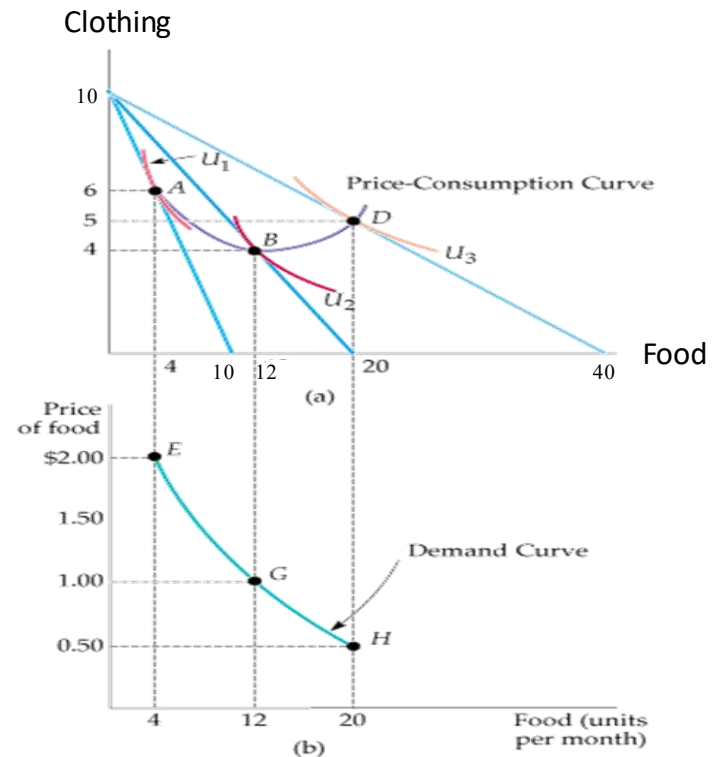
- Fix  $I = \$20$ ,  $P_C = \$2$ . **Now change  $P_F$ .**
- When  $P_F = \$2 \rightarrow A = (4, 6)$
- When  $P_F = \$1 \rightarrow B = (12, 4)$
- When  $P_F = \$0.5 \rightarrow D = (20, 5)$
- **Price-consumption curve:** Curve tracing utility maximizing market baskets as the price of one good changes.



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The demand curve of an agent follows from the consumption choices a person faces when faced with a budget constraint.

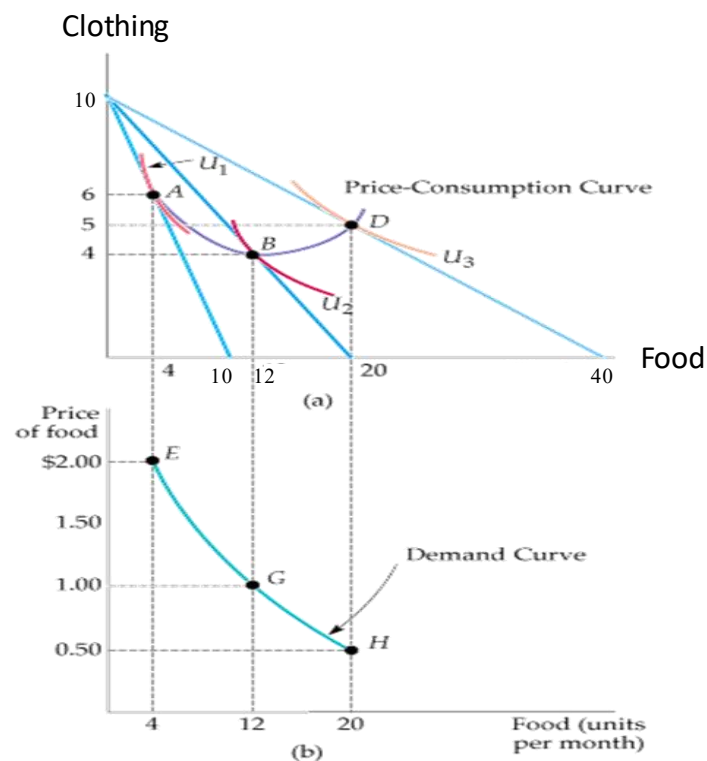
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- When  $P_F = \$0.5 \rightarrow D = (20, 5)$
- Focus on how different  $P_F$  leads to different consumption levels of food.
- **Individual demand curve:** curve relating the quantity of a good that a single consumer will buy to its price.



## 4. Individual Demand: Price Changes

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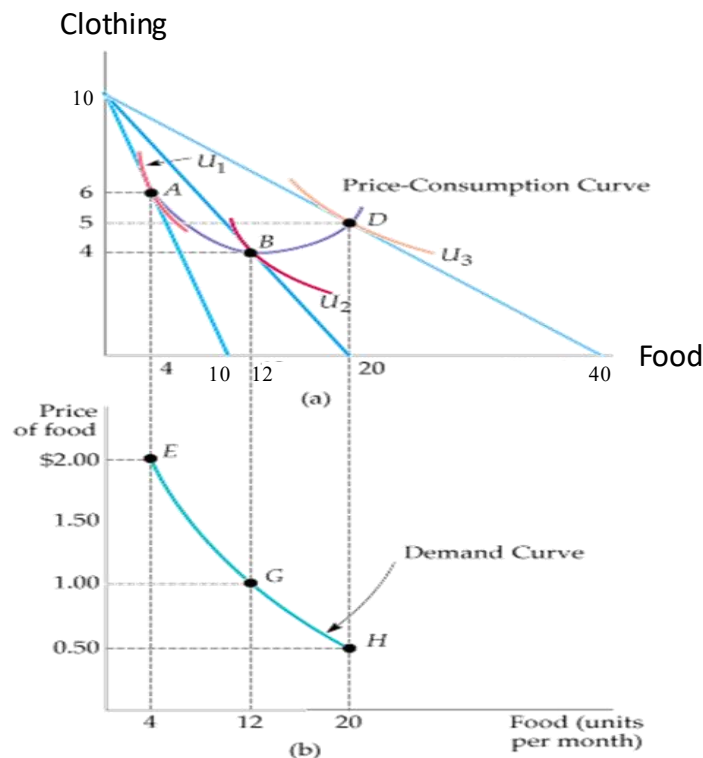
- Remark 1: The level of utility that can be attained changes as we move along the demand curve.
- Remark 2: At every point on the demand curve, the consumer maximizes the utility by setting  $MRS = P_F/P_C$  (in the default case)



## 4. Individual Demand: Price Changes

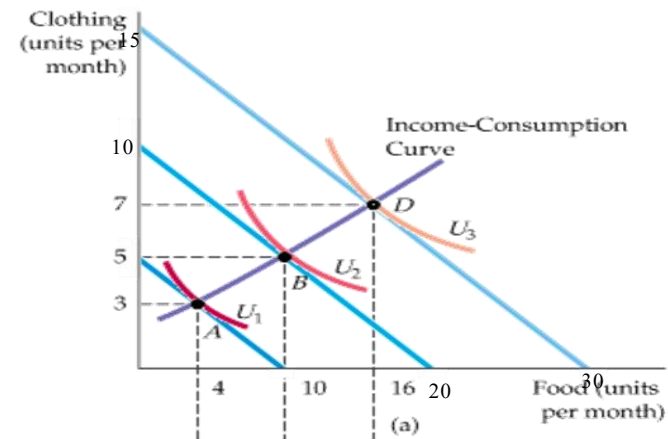
The demand curve of an agent follows from the consumption choices a person faces when faced with a budget constraint.

- Remark 3: The demand curve shows the consumer's willingness to pay for each unit of consumption.
- E.g., The consumer's willingness to pay for the 4<sup>th</sup>/12<sup>th</sup>/20<sup>th</sup> unit of food is **\$2/\$1/\$0.5**.
- Because  $MRS = P_F/P_C$  implies  $MRS * P_C = P_F$ .
- $MRS$ : the quantity of C the consumer is willing to give up in exchange for 1 additional unit of F.
- $MRS * P_C$ : **willingness to pay** (in terms of dollars) for 1 additional unit of F.
- $P_F$ : price dimension in the demand curve



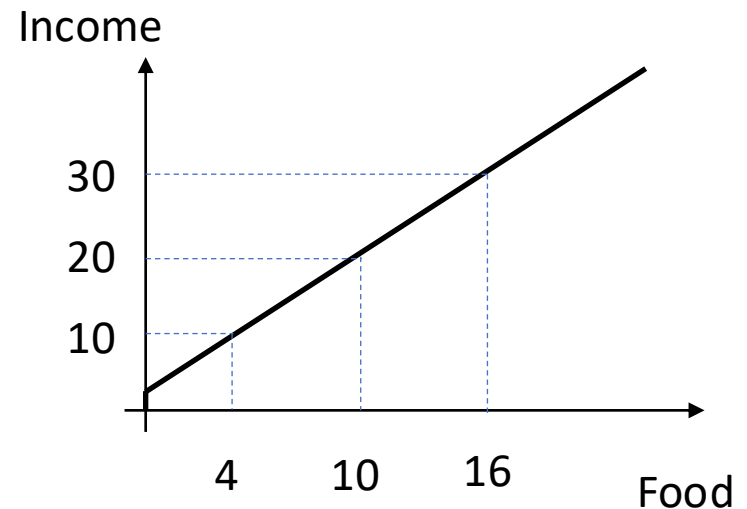
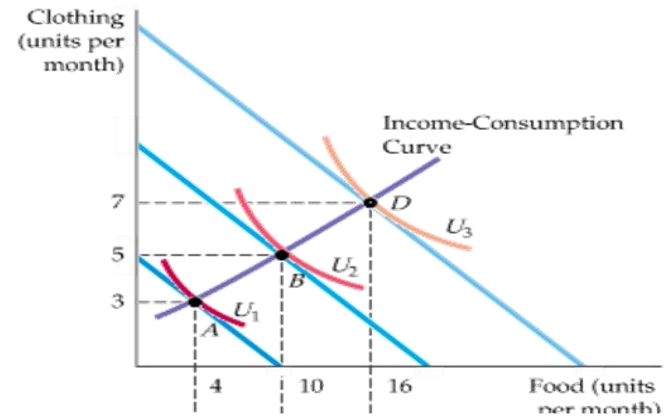
## 4. Individual Demand: Income Changes

- Fix the prices of the two goods:  $P_F=1$ ,  $P_C=2$ . **Change the income level.**
- When  $I = 10 \rightarrow A=(4, 3)$
- When  $I = 20 \rightarrow B=(10, 5)$
- When  $I = 30 \rightarrow D=(16, 7)$
- **Income-consumption curve:** Curve tracing utility maximizing market baskets as the consumer's income changes.



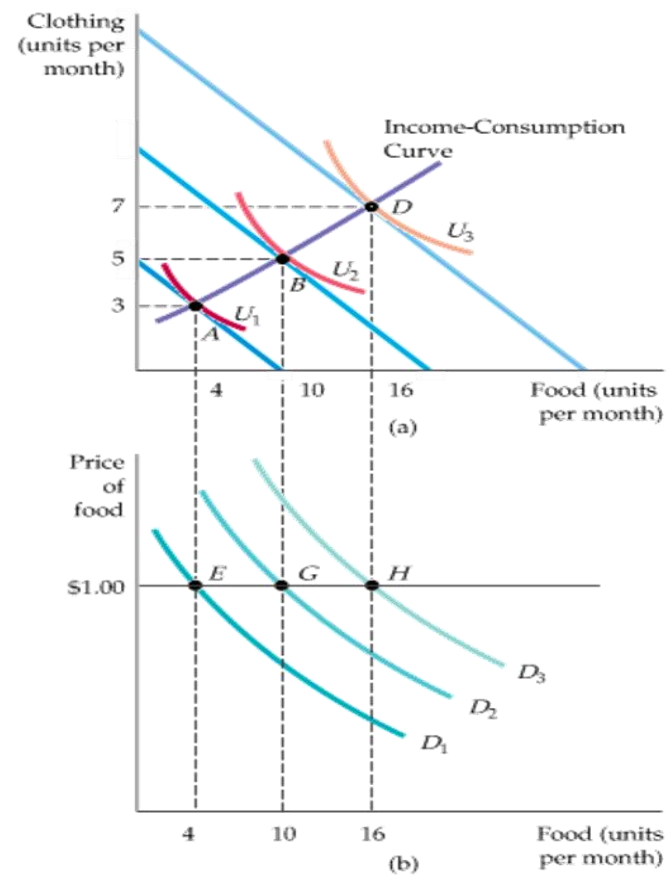
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- Focus on how different income levels lead to different consumption levels of food.
- Engel curve:** the curve that relates the quantity of a good consumed to income.



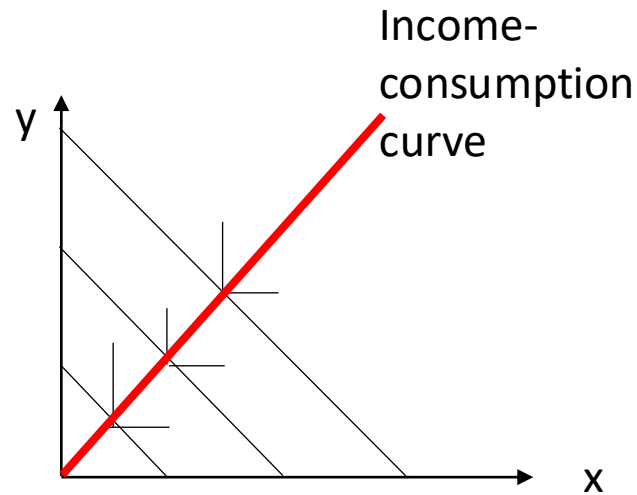
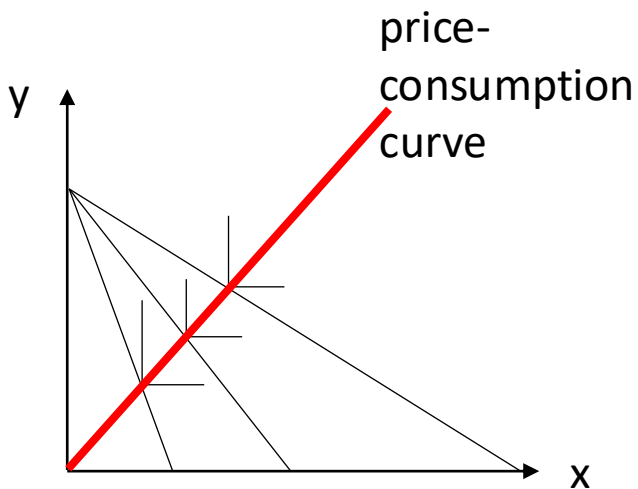
## 4. Individual Demand: Income Changes

- How does income change affect the demand curve of food?
- $P_F=1$ ,  $P_C=2$ .
- When  $I = 10 \rightarrow A=(4, 3)$
- When  $I = 20 \rightarrow B=(10, 5)$
- When  $I = 30 \rightarrow D=(16, 7)$
- Income change leads to a shift of individual demand curve.



Exercise: When Good X and Good Y are perfect complements. The kinks of the indifference curve fall on the 45-degree line. If we change the price of Good X only, what does the **price-consumption curve** look like? If we change the income only, what does the **income-consumption curve** look like?

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## 4. Individual Demand: Normal versus Inferior Goods

### **A NORMAL GOOD**

An increase in a person's income leads to more consumption of this good.  
e.g., fine restaurant, name-brand products

### **AN INFERIOR GOOD**

An increase in a person's income leads to less consumption of the good.  
e.g., fast/canned food, generic products

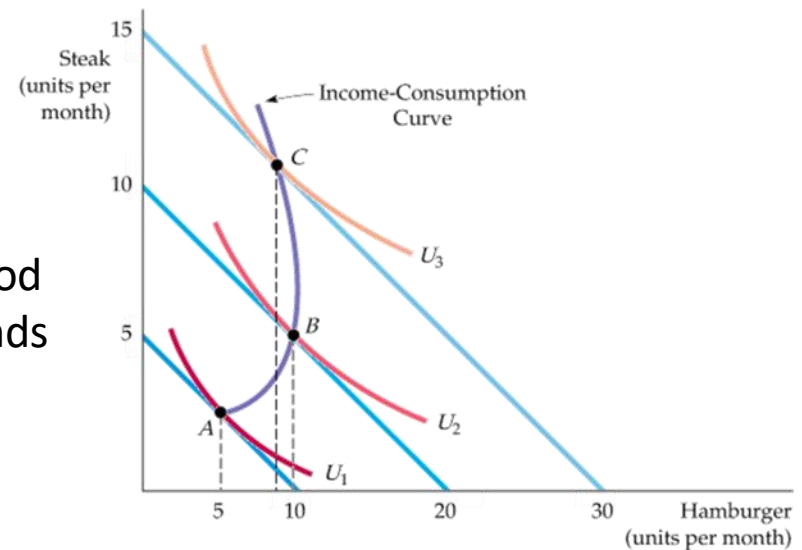
## 4. Individual Demand: Normal versus Inferior Goods

**At least two ways for you to tell whether some good is normal or inferior.**

- Method 1: By looking at the slope of income-consumption curve;
- Method 2: By looking at the slope of Engel curve.

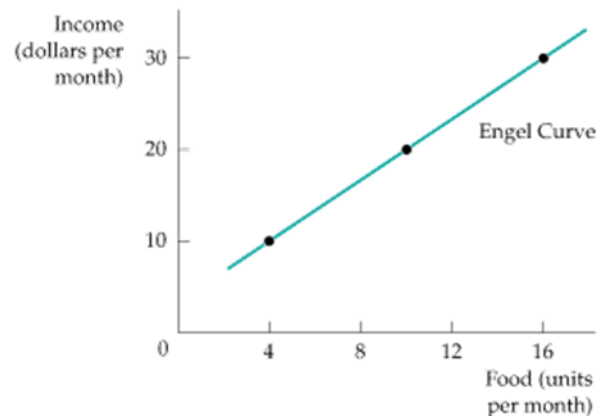
Here, hamburger, though a normal good between *A* and *B*, becomes an inferior good when the income-consumption curve bends backward between *B* and *C*.

Whether a good is normal or inferior may depend on the specific market situation.



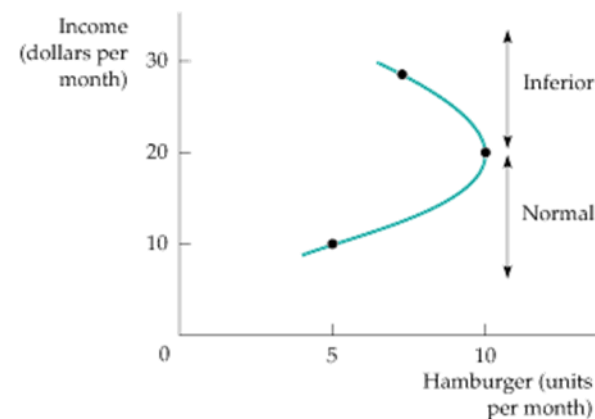
#### 4. Individual Demand: Normal versus Inferior Goods

In **(a)**, food is a normal good and the Engel curve is upward sloping.



(a)

In **(b)**, however, hamburger is a normal good for income less than \$20 per month and an inferior good for income greater than \$20 per month.



(b)