

# **Safeguarding The Food Supply Against BSE**



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# What is BSE?

- BSE stands for Bovine Spongiform Encephalopathy
- Neurological disease of cattle
- Transmitted via feed and feeding practices
- Linked to variant Creutzfeldt-Jakob Disease in humans

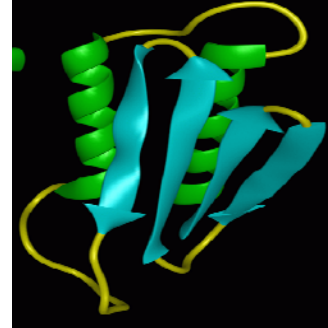
# The Causative Agent

Normal Prion Protein



PrP<sup>c</sup> cellular




Mis-folded Prion Protein



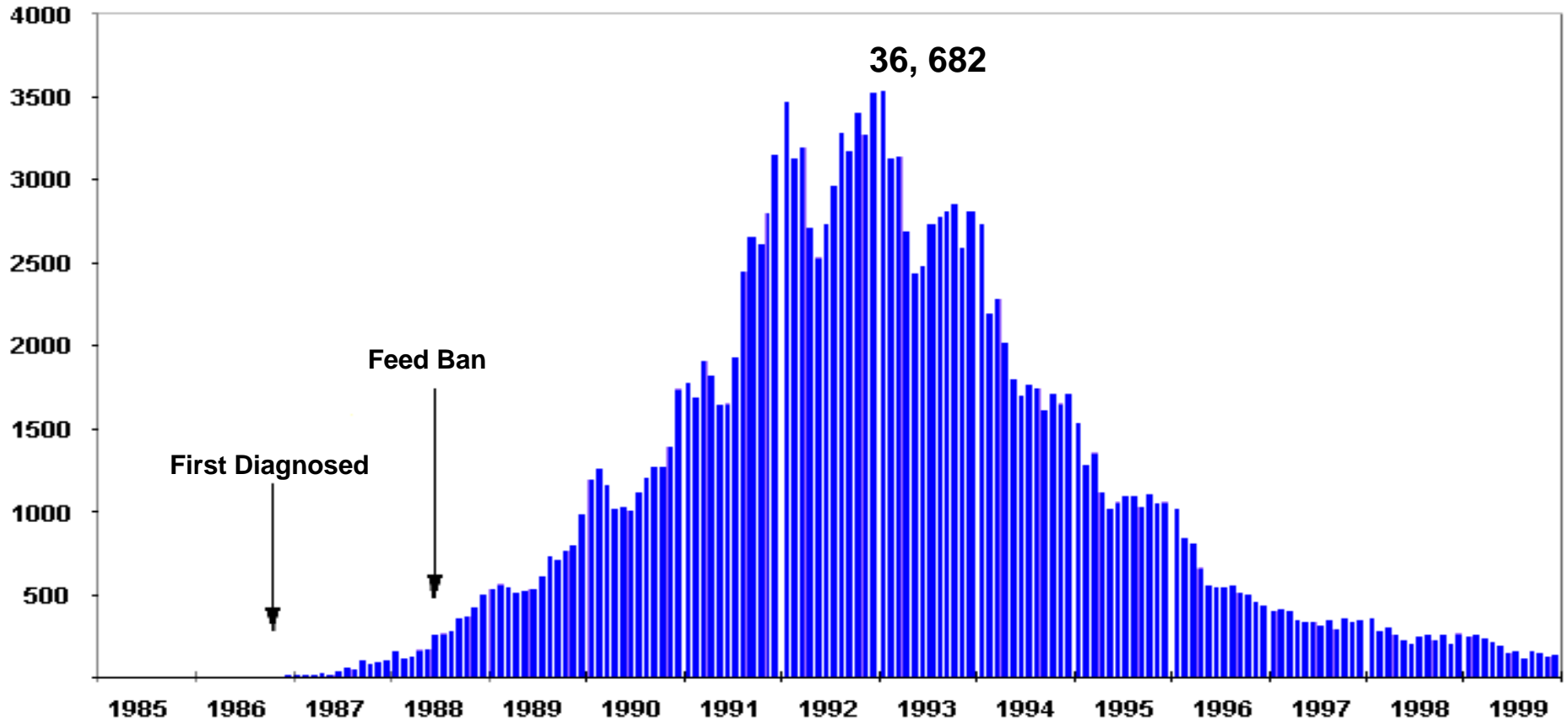
PrP<sup>sc</sup> scrapie

- Prion Protein Hypothesis: the causative agent of all TSEs is an abnormal form of the prion protein
  - PrP<sup>c</sup> occurs normally in vertebrates – found at high levels in nervous tissue
  - Disease form resists breakdown and causes the normal form to mis-fold into the abnormal structure
  - Process takes approximately 5 years in cattle from exposure at calthood until clinical disease

# Animal TSEs

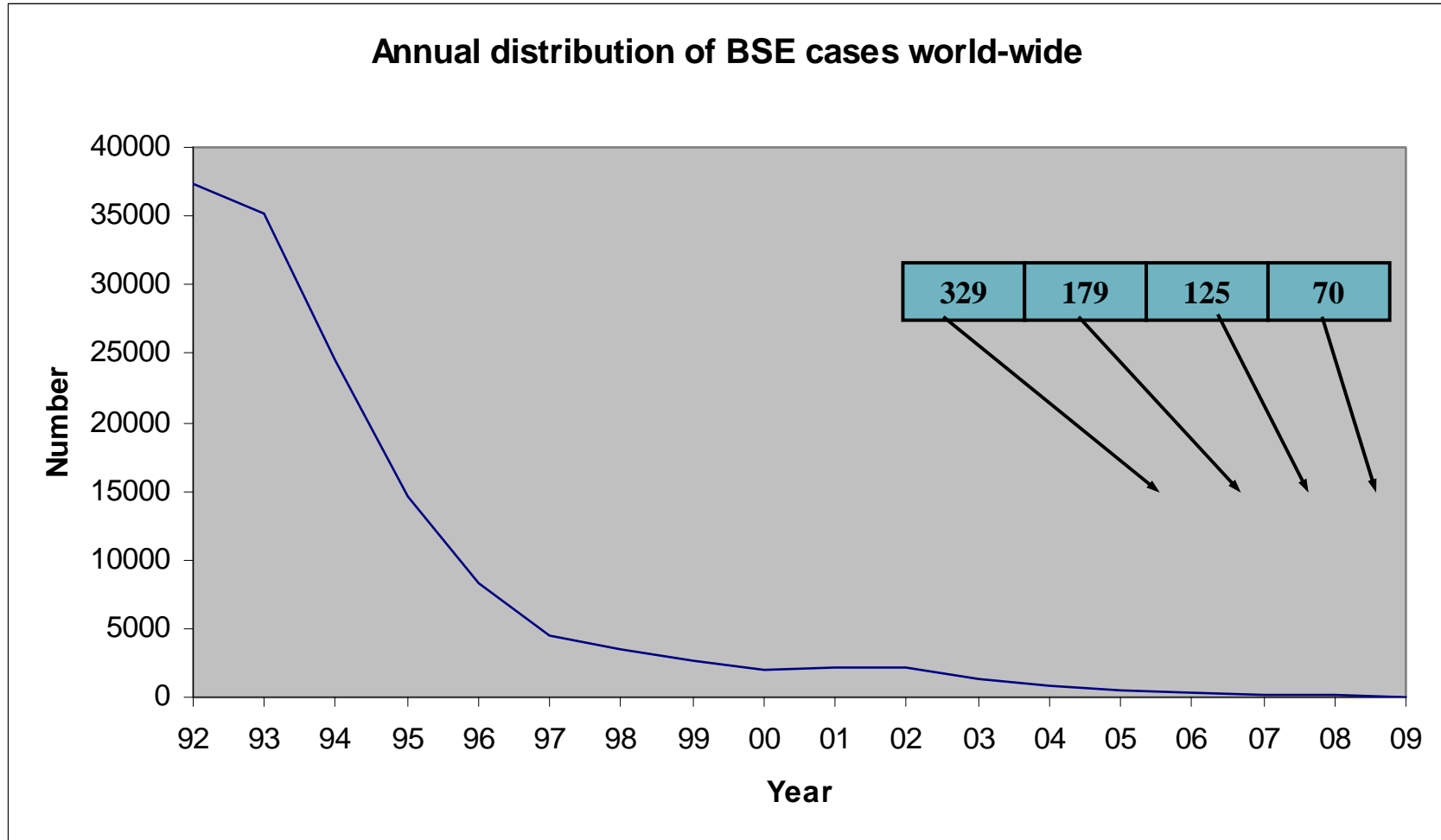
		<b>Transmission</b>	<b>Tissue distribution</b>	<b>Known human susceptibility</b>
<b>scrapie</b>		Lambing (placenta)	Lymph nodes, then central nervous system	No
<b>CWD</b>		Saliva feces	Lymph nodes, then central nervous system	No
<b>BSE</b>		Animal feed	Direct route to central nervous system	Yes

# UK BSE Outbreak



# Annual Distribution of BSE Cases World-wide

Adapted from [http://www.oie.int/eng/info/en\\_esbmonde.htm](http://www.oie.int/eng/info/en_esbmonde.htm)



# Reported BSE/vCJD cases as of Dec 2009

BSE Total = 190,501 vCJD Total = 217

Adapted from [http://www.oie.int/eng/info/en\\_esbmonde.htm](http://www.oie.int/eng/info/en_esbmonde.htm)

Country	BSE	vCJD	Country	BSE	vCJD
Austria	6		Liechtenstein	2	
Belgium	133		Luxembourg	3	
Canada	18	1	Netherlands	85	3
Czech Republic	28		Poland	67	
Denmark	17		Portugal	1061	3
Finland	1		Slovakia	24	
France	1001	25	Slovenia	8	
Germany	417		Spain	742	5
Greece	1		Sweden	1	
Ireland	1646	4	Switzerland	464	
Israel	1		UK	184595	170
Italy	142	1	USA	3	3
Japan	35	1	Saudi Arabia		1

# Protecting the U.S. From BSE

- FDA – Center for Veterinary Medicine
  - keep BSE out of the animal feed supply
- USDA – Animal and Plant Health Inspection Service
  - keep foreign animal diseases out of U.S.
  - conduct disease surveillance
- USDA Food Safety and Inspection Service & FDA Center for Food Safety and Applied Nutrition
  - keep BSE out of the human food supply
- Other FDA Centers
  - protect the blood supply
  - protect drugs, biologicals, and devices made from bovine origin material



# BSE Surveillance in the United States

- USDA > 1,000,000 cattle tested in the US since 1990
  - First case detected in Washington State in 2003
- Enhanced surveillance: June 1, 2004 – August 20, 2006
  - 787,000 highest risk cattle
  - 1 case detected in Texas in 2005
  - 1 case detected in Alabama in 2006
- Ongoing surveillance
  - September 1, 2006 – Present
  - Goal: 40,000 samples per year

# Ruminant Meat and Bone Meal (MBM)



- Provides valuable nutrients - allowed for use in feed for all species until linked to BSE in the UK outbreak
- No longer allowed in ruminant feed

# Rendering Process

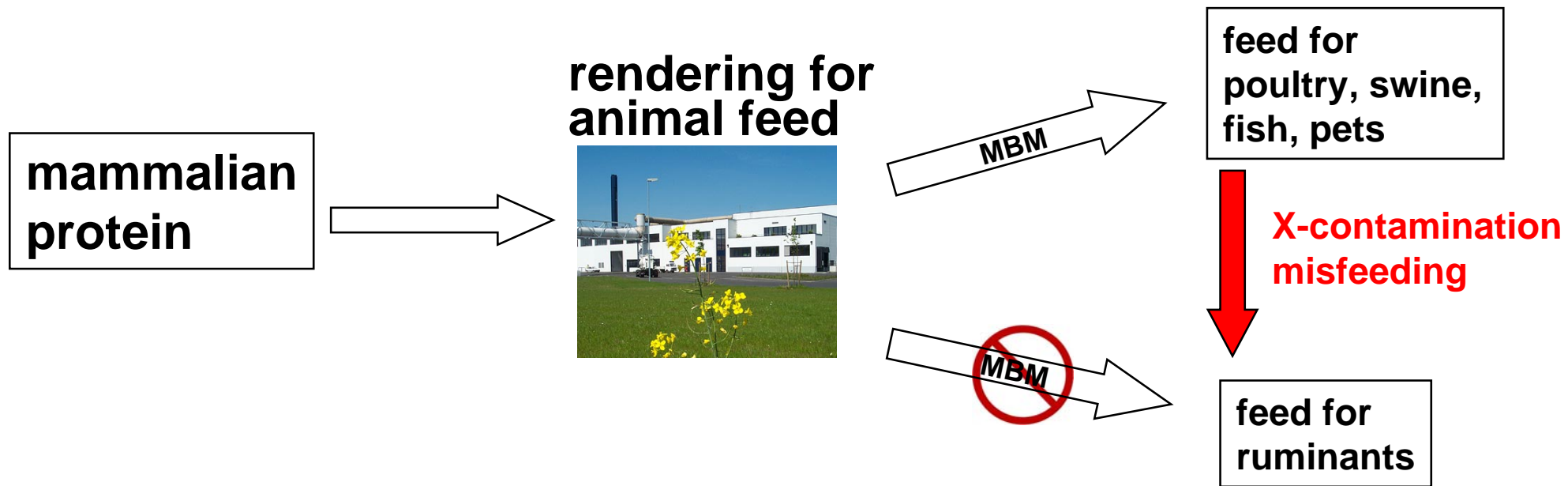


- Raw Materials:
    - slaughter by-products
    - livestock mortalities
  - Cooking:
    - 245-290° F
    - 40-90 minutes
    - Evaporates water (50%)
  - Yield:
    - Fat (25%)
    - Meat and bone meal (25%)
- 
- If present, the rendering process reduces but does not completely eliminate the BSE agent.

# 1997 (Original) BSE Feed Regulation

- **Prohibits feeding mammalian protein to ruminants**
  - Exceptions: milk products, blood products, gelatin, porcine/equine protein, and plate waste
- **Requirements**
  - Adequate measures for preventing cross-contamination
  - maintain receipt, processing, and distribution records for one year (and make available for inspection)
  - Label products with caution statement “Do not feed to cattle or other ruminants”

# 1997 BSE Feed Regulation (Feed Ban)

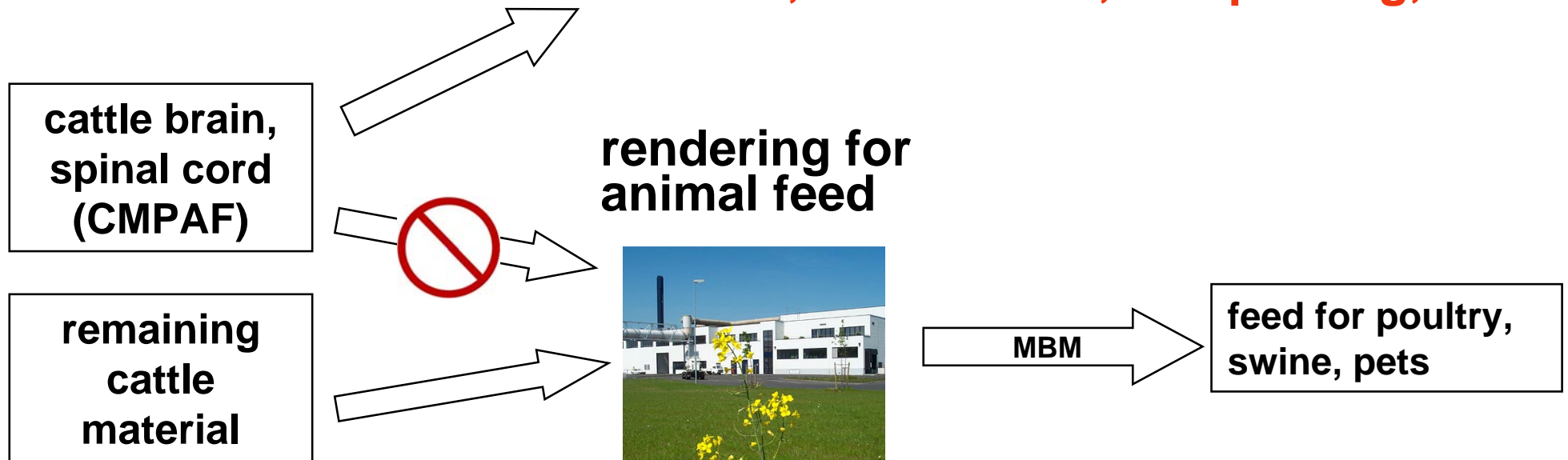


# 2008 BSE Regulation

- Published: April 25, 2008
- Compliance Date: October 26, 2009
- Prohibits for use in ALL animal feed material known as “cattle material prohibited in animal feed” (CMPAF)
  - CMPAF consists mainly of the brain and spinal cord from cattle 30 months of age and older

# 2008 BSE Feed Regulation

landfill, incineration, composting, etc



# Enforcement of the Feed Ban

- FDA and State Inspections
  - About 350 FDA HQ and field investigators
  - About 400 state inspectors
- More than 76,000 inspections since 1997, and about 8000 per year under current work plan
  - >70% conducted by state feed control officials
  - State inspection results submitted through FDA District BSE Coordinators
  - All inspections go into our FACTS database
  - Inspection summaries are viewable by the public on the internet



# Online Access to Inspection Results

Inspection Database: <http://www.accessdata.fda.gov/BSEInspect/>

U.S. Department of Health & Human Services www.hhs.gov

**FDA U.S. Food and Drug Administration** Search  go

### FDA BSE/Ruminant Feed Inspections Firms Inventory

FDA Home > FDA BSE/Ruminant Feed Inspections Firms Inventory

Data reported as of: 08/29/2009

Display Entire FDA BSE/Ruminant Feed Inspections Firm Inventory Report as an Excel Spreadsheet Help

**Search By**

Firm ID (FEI)

Advanced Search

FDA District	Firm Name	State	Firm Type(s)
API-DO ▲	<input type="text"/>	AA ▲	Animal Feed/Pet Food Salvager (AF) ▲
ATL-DO ▼		AE ▼	Distributor/Retailer (DR) ▼
BLT-DO		AK	Feed Mill (FDA Licensed) (FL) ▼
CHI-DO		AL	
CIN-DO ▼		AP ▼	

**Last BSE Inspection Date**

From (mm/dd/yyyy)	To (mm/dd/yyyy)	BSE Program Risk Identifier	Last BSE District Decision**	Handles Feed for Rum. Animals?
<input type="text"/>	<input type="text"/>	Only Distributes Prohib. Mat (DP) Handles Prohibited Materials (HP) Does not handle Prohib. Mat (NP)	Official Action Indicated (OAI) ▲ Voluntary Action Indicated (VAI) ▼ No Action Indicated (NAI)	Yes ▲ No ▼ No Response ▼

**Sort By**

Last BSE District Decision ▲  
BSE Program Risk Identifier ▼  
FDA District ▼

# Feed Sampling & Analysis

- Testing is complex due to lack of a definitive analytical method
- Test for the presence of prohibited mammalian protein
  - no methods available to test feed for the BSE agent
- FDA uses feed microscopy and polymerase chain reaction (PCR) as our official methods
- FDA does not enforce based only on an adverse test
  - Follow-up investigation is needed to confirm findings

# Questions?

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