Some notes on domestication - the process

) what is domestication?

development of control of plant and animals by humans to the extent that it changes or alters their genetic make-up, and in rare cases makes them unfit to survive without human aid or intervention - ex. maize (corn).

This is frequently done by

1) planting crops in niches where they are not naturally adapted
2) removing certain pressures of natural selection to allow more deviants from normal phenotypes to survive.
3) select for characters not beneficial under conditions of natural selection.

For animals frequently this is reflected in control of breeding of animals.
select for size, docility, or some other specific character, - color, hair covering, body type, etc.

) How does one recognize it?

Recognizing domestication archaeologically can be a significant problem. - for several reasons. - soft parts, preservation, reflection of genetic changes being preserved in hard parts. Initial stages of domestication - will have minimal impact on the morphology of the plant or animal.

Plants

1) seed or fruit size increases, flesh thickness increases, seed size of individual plants may become more homogeneous.
2) for grains - seed dispersal mechanisms may be altered
   selection for plants which do not drop seed readily. example: rachis - tough versus brittle
3) geographic distribution may change
   find plants in areas where the wild progenitors were not found

Animals

1) size of animals changes
   either bigger or smaller depending on selection pressures
   ex. dogs and cattle show initial size decease from wild progenitors, believed to be selection for docility, (only later bred for large size.)
   horses, size increase quite immediate as they are being selected for ability to carry loads.
2) geographic distributions changes - found outside range of natural progenitors
3) population characteristics of archaeological assemblages change in systematic ways.
   h and g accumulated assemblages tend to be variable - eclectic choice - age, sex, condition, multiple taxa frequently associated
   sometimes mass herd hunting provides different profile - but regular patterns
   - but indiscriminate to age and/or sex

   herders - selectively cull
   chop males out - seasonal culling - often at start of dry or winter season to reduce feeding costs.
   females kept for breeding
   frequently cull animals at young adulthood - to maximize weight gain and minimize feeding cost
   - or they cull aged animals with low fertility
4) osteological changes
   bone densities - wild versus penned
   changes in horn cores/ selective breeding
   size - shape of jaws versus teeth

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Figure 8.5 The features affecting seed dispersal and spikelet implantation in wild and domesticated einkorn wheat.

From Fagan, B. M. 1998. *People of the Earth*. 8th ed. Harpercollins. Fig. 8.5, p. 239.

Probable 'hearths of domestication' of some common plants and animals

New World

Mesoamerica

maize
gourds
squash
beans (many)
chili peppers (*Capsicum*)
avocado
cacao
tomato
vanilla
papaya
guavas
tobacco

turkey
Muscovy duck

North America

amaranth
sunflower

South America

cotton
potato
peppers
manioc
squash
beans
pineapple
sweet potato
coca
peanut ?

llama
alpaca
guinea pig

Old World

Africa

sorghum
yams
millets
oil palm
gourds
coffee
rice (African)
watermelon
teff

cat
cattle
donkey

Europe

carrots
parsnips
beets
asparagus
hazel nut

cattle ?
horse
reindeer
dog

Western Asia

wheat
barley
rye
oats
dates
lentils
turnips
onions
garlic
leeks ?
cucumber
lettuce
spinach
figs
apple
pear
pomegranates
plums
olives
almonds
pistachio nuts

dog
goats
sheep
camel
pigs
cattle ?

Eastern Asia

millets
rice
bananas
coconut
apricot
soy bean
sugar cane
citrus
peach
radish ?
yams
bottle gourd
cotton

dog
chicken
pigs
cattle