

How it all began: the prehistoric origins of dairying and cheese-making in Ireland and continental Europe

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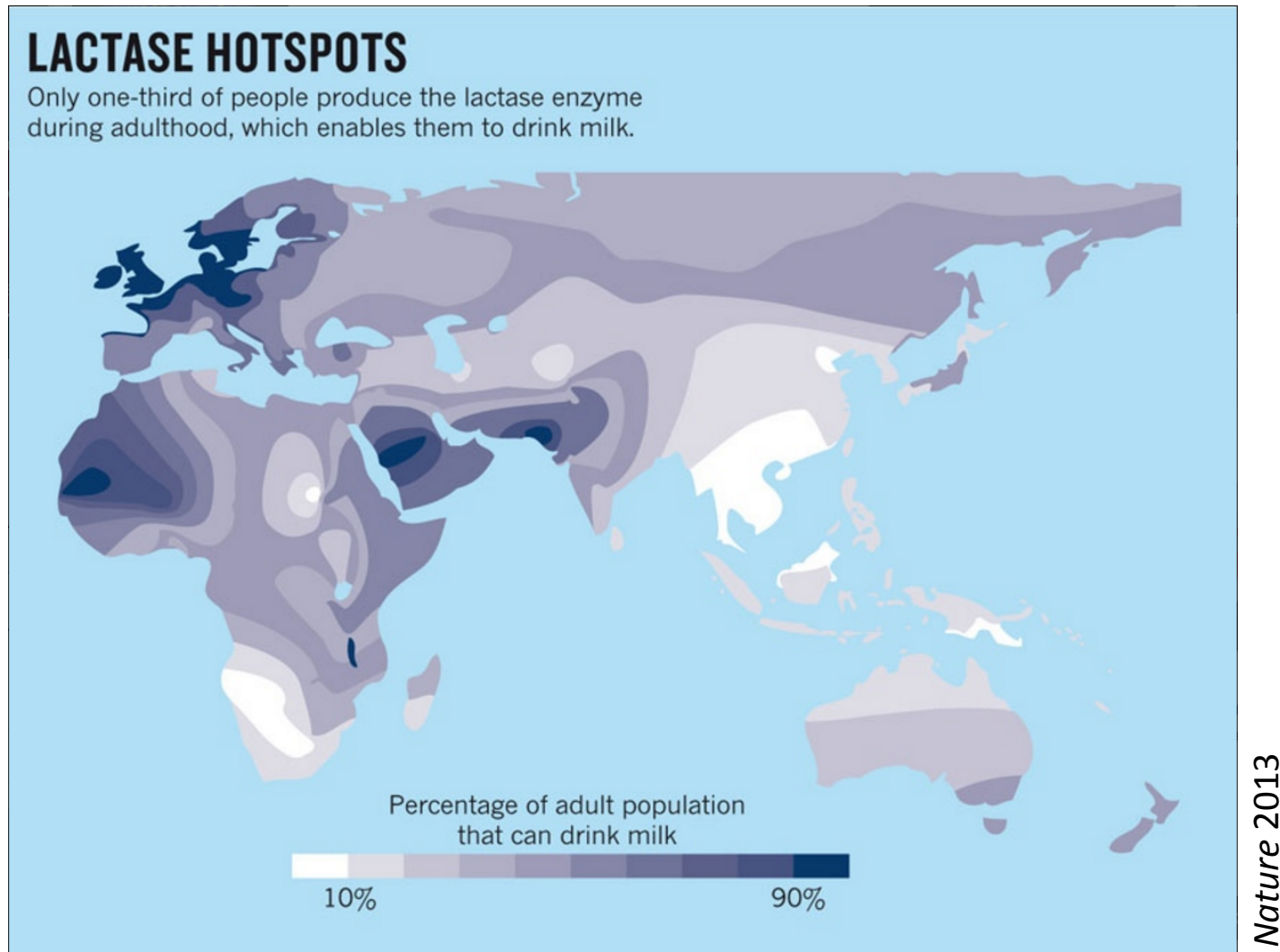


Lactase Persistence (LP) – allows digestion of milk beyond infancy

Lact**ase** = **enzyme**

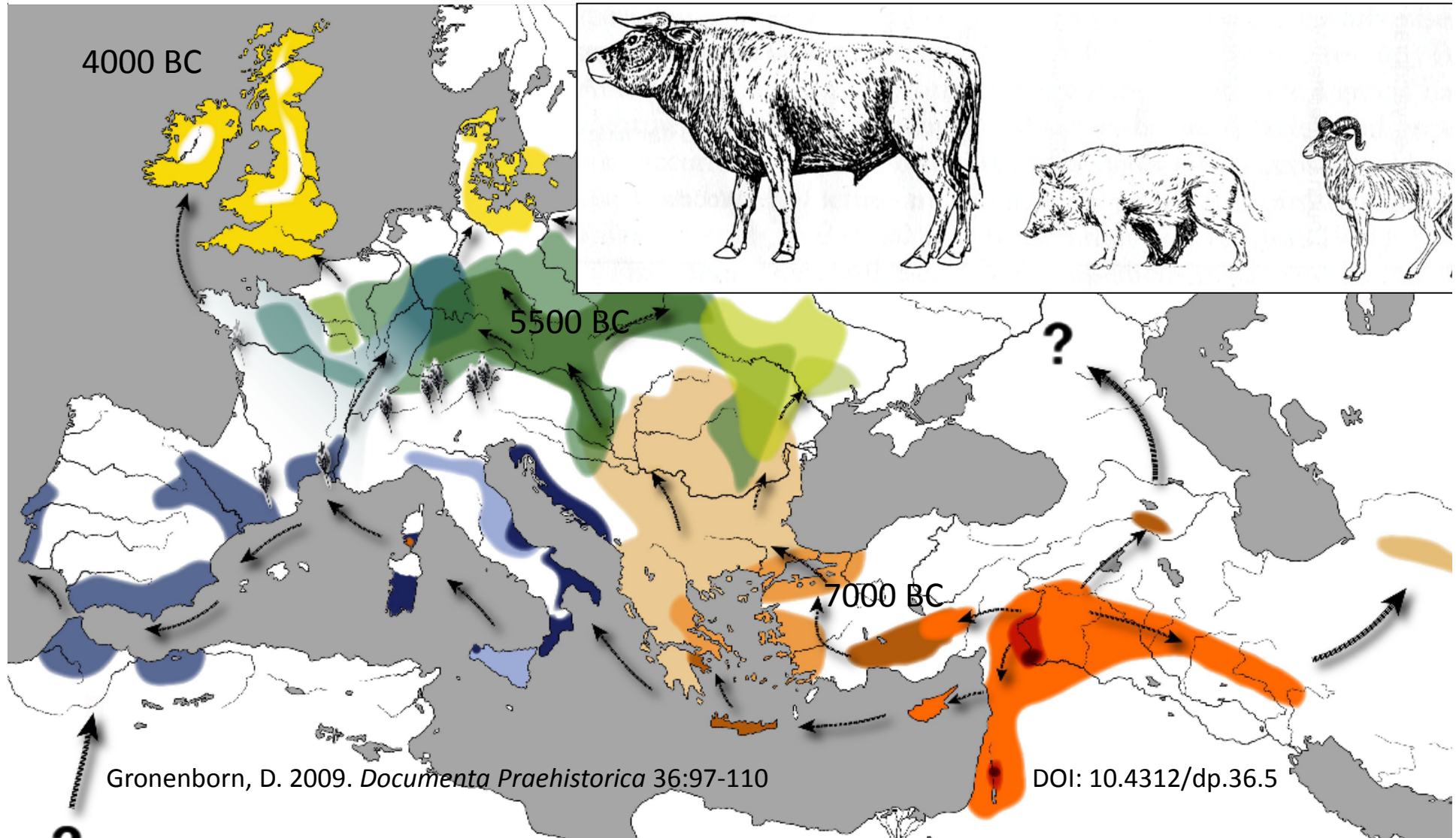
Lact**ose** = **sugar** in milk

Lactase persistence varies greatly across globe, even across Europe



LP and milk-drinking cultures – how **old** is this relationship?

The spread of farming through Europe – the Neolithic



'Secondary Products' Revolution

Sherratt, A.G. 1981. Plough and pastoralism: aspects of the Secondary Products Revolution. In I. Hodder, G. Isaac and N. Hammond (eds), *Pattern of the Past: studies in honour of David Clarke*, 261-206.

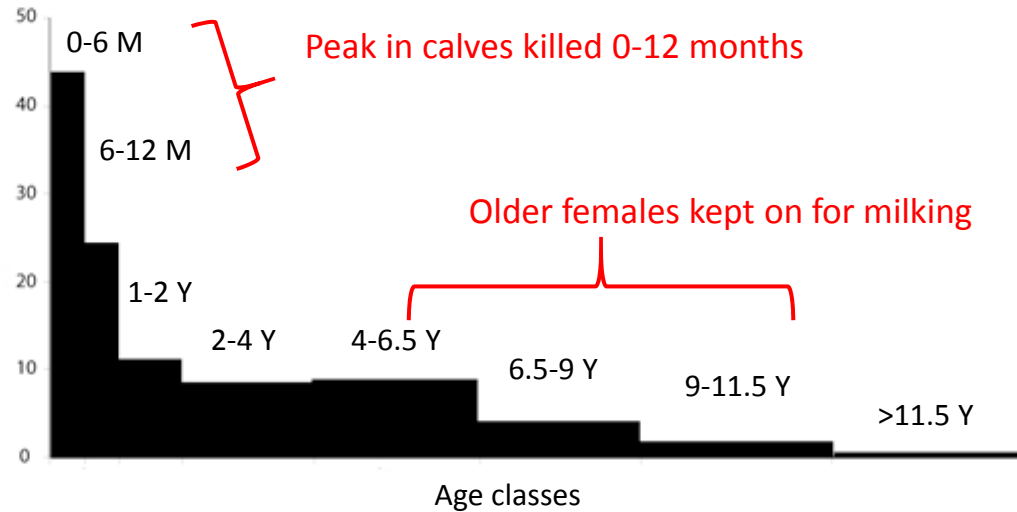
Appearance of domesticated cereals, animals, pottery etc.
widely acknowledged as a Neolithic 'Revolution'

'Secondary Products Revolution' – idea that **dairying, wool, traction** came afterwards, emerging in the Bronze Age

Very influential interpretation of prehistoric farming societies

Detecting dairying in the archaeological record

Analysing the animal bone on sites



'Kill-off' profile – ages animals are being slaughtered

(left) Typical kill-off profile of a dairy herd

Quite often, very little animal bone (acidic soils, badly preserved)



We have to look at other sources of evidence...

Fats preserved in prehistoric pottery vessels



6000 year-old Neolithic houses
Upper Campsie, Derry/Londonderry



2-3 grams of cleaned potsherd crushed to a powder

Ancient lipid residues extracted from this powder with solvents

Identifying archaeological fats

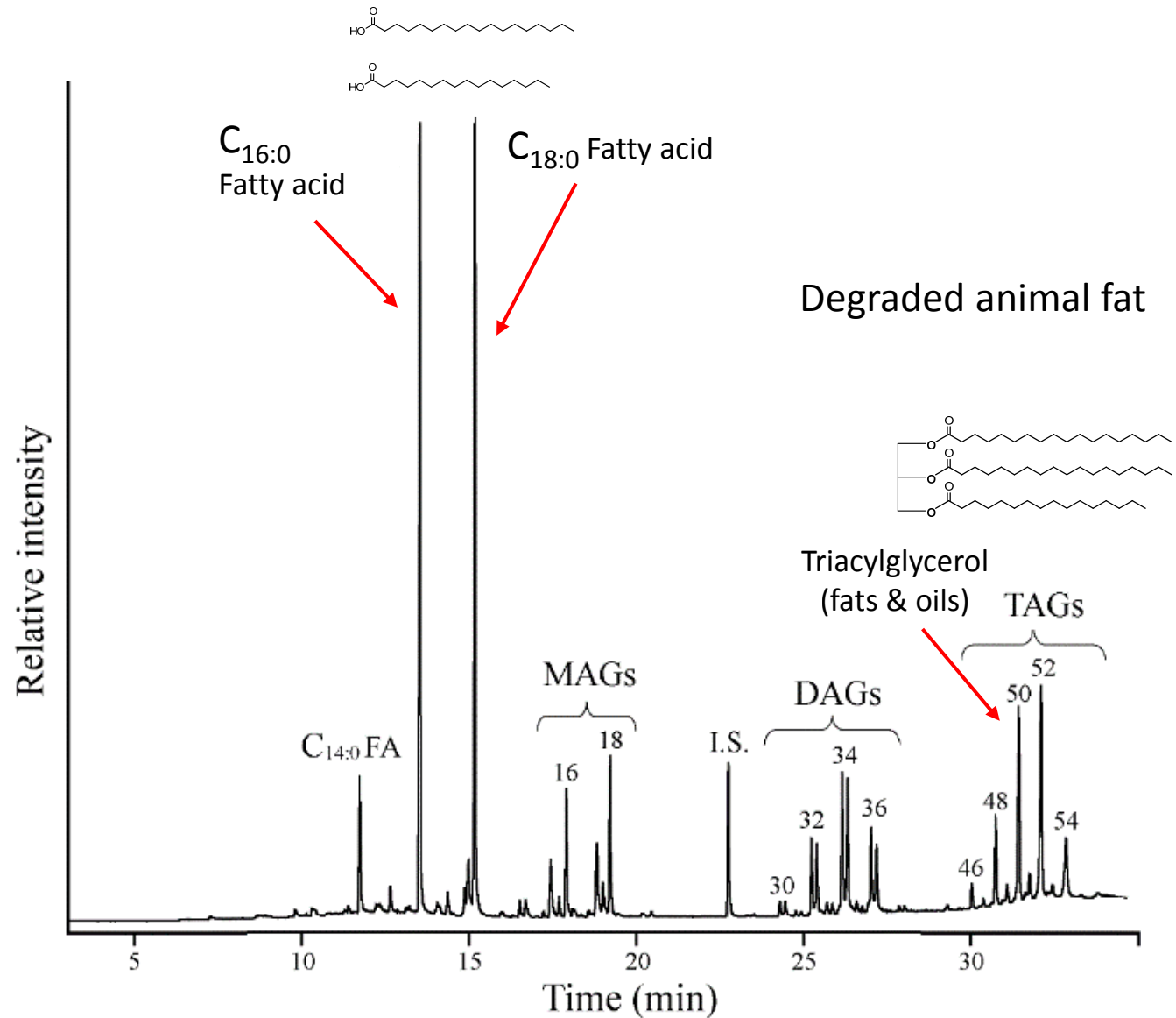
Microscopic

Grain of sand -
millions of fat
molecules

Micrograms (μg)
1 **millionth** of a
gram!



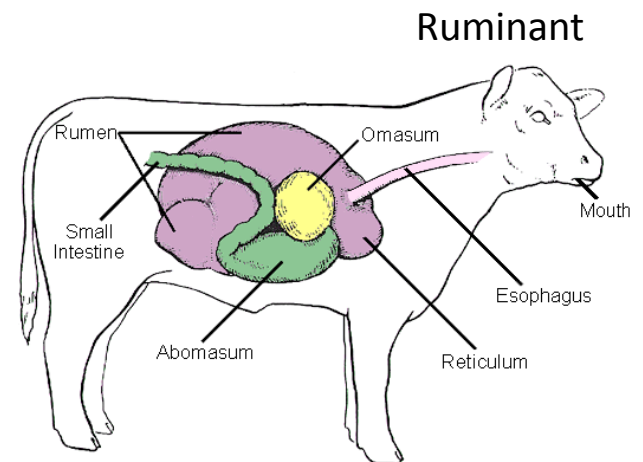
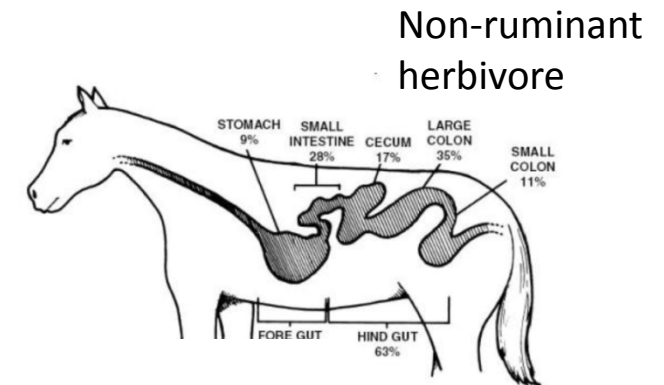
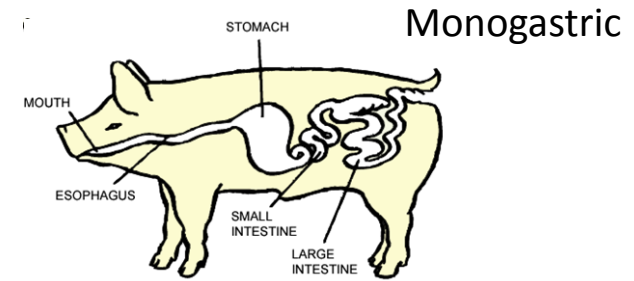
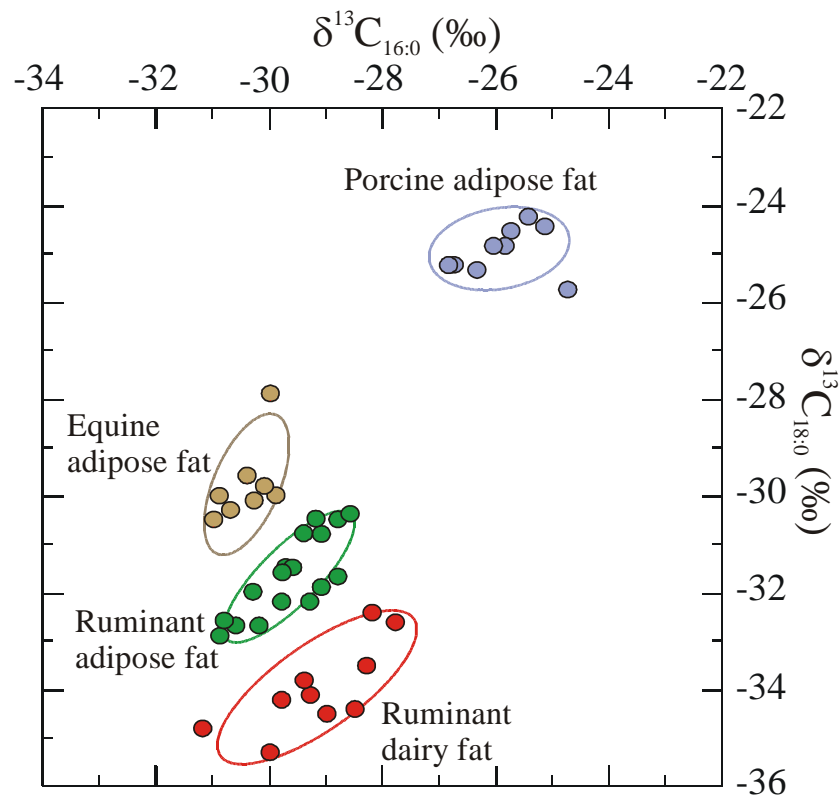
Fat extracted from pot



What kind of animal? What kind of fat?

Milk fat and carcass fats are produced in different ways

This is reflected in different carbon isotope values in their fatty acids

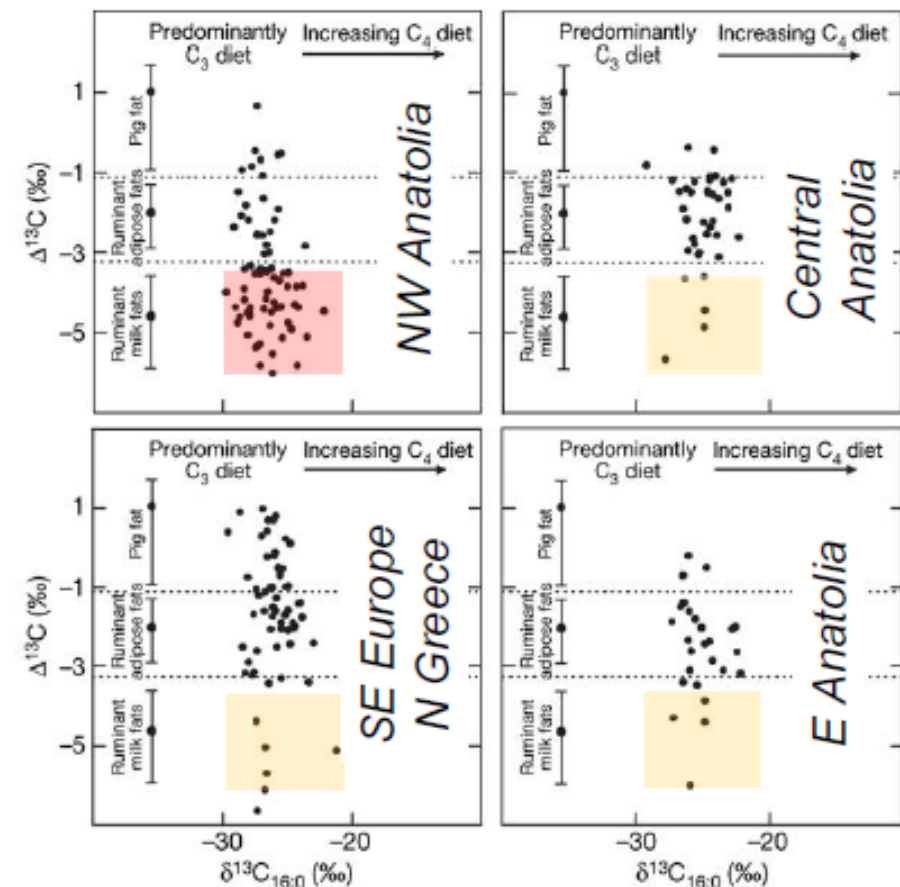


Dairying present very early in development of farming

Milk fats present in pots from early Neolithic
7th millennium BC – northwestern Anatolia

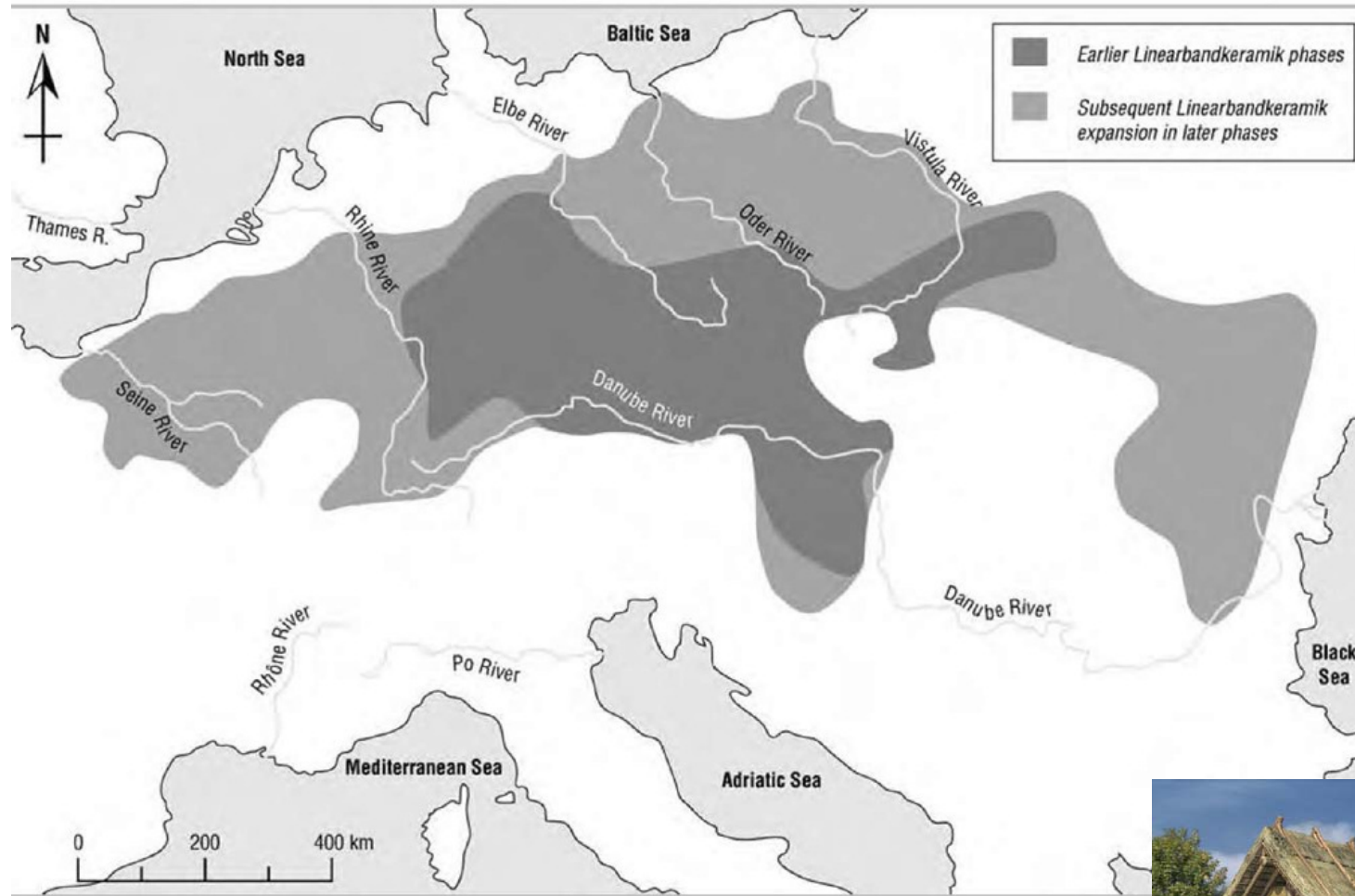
High incidence in pots where cattle most abundant
in archaeological record

Regional variability



Evershed *et al.* 2008. Earliest date for milk use in the Near East and southeastern Europe linked to cattle herding. *Nature* 455, 528-31

The first central European farmers - *Linearbandkeramik* (LBK)



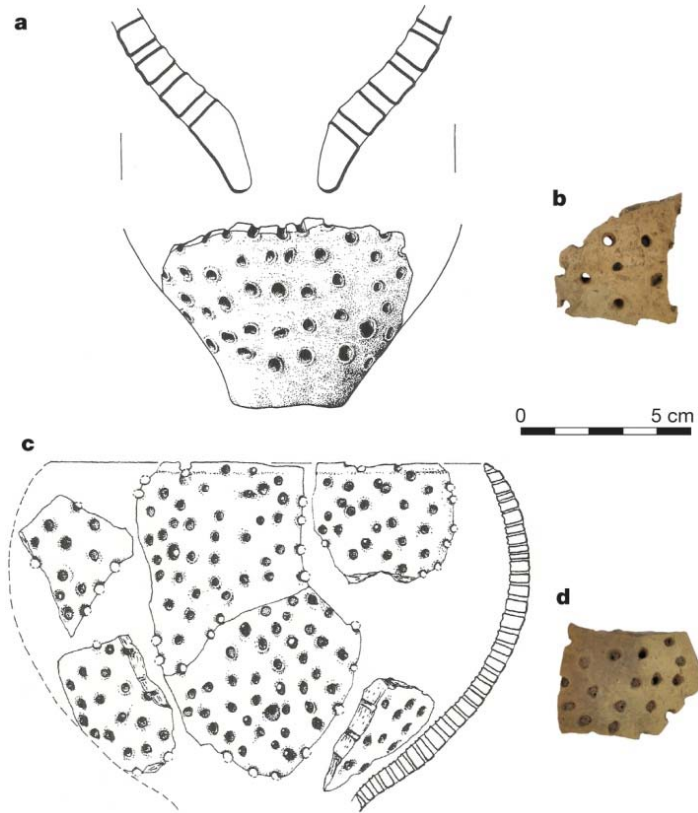
Named after their distinctive pottery with linear bands of decoration

c. 5400 – 4900 BC

Lived in timber longhouses
Garden plot agriculture
Livestock



Earliest evidence for dairying in central Europe

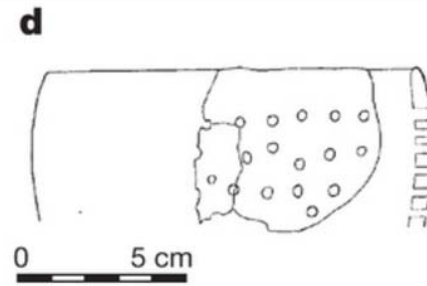
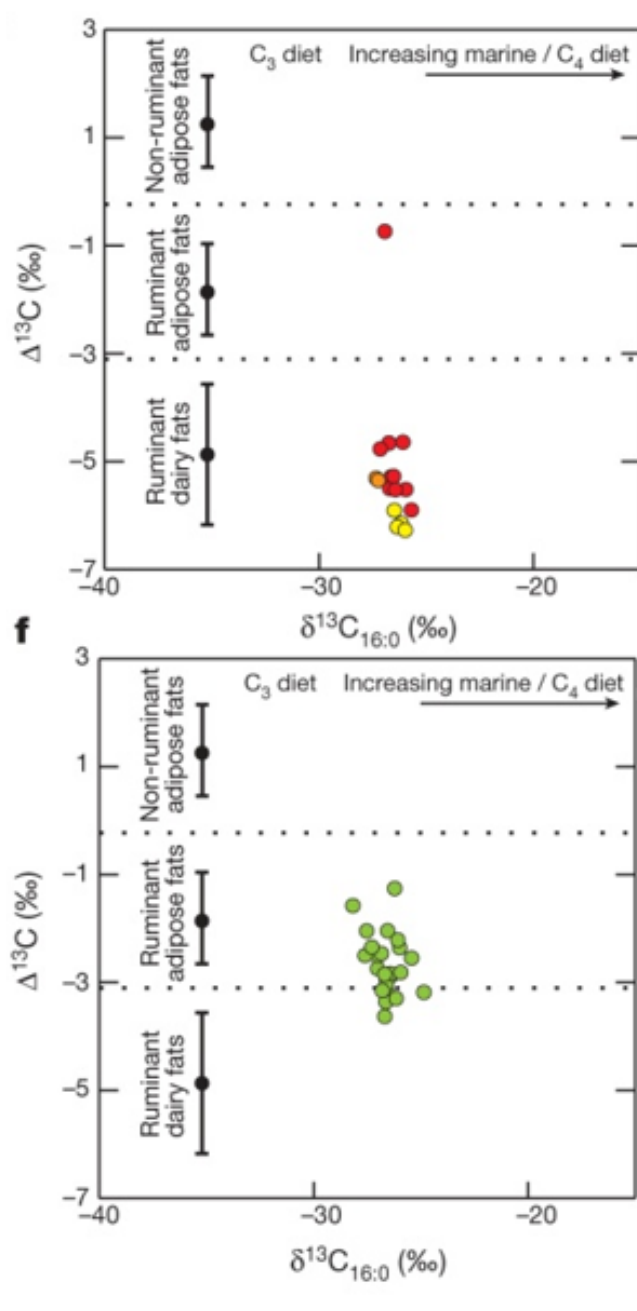


Perforated vessels or 'sieves'
Kuyavia region, Poland
c. 5200 BC

19th/20th century and contemporary cheese strainers



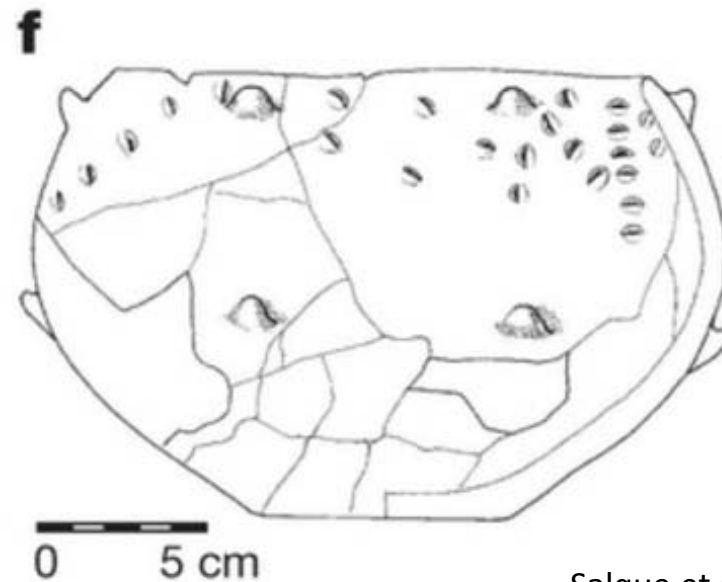
Ludwinowo settlement, Poland



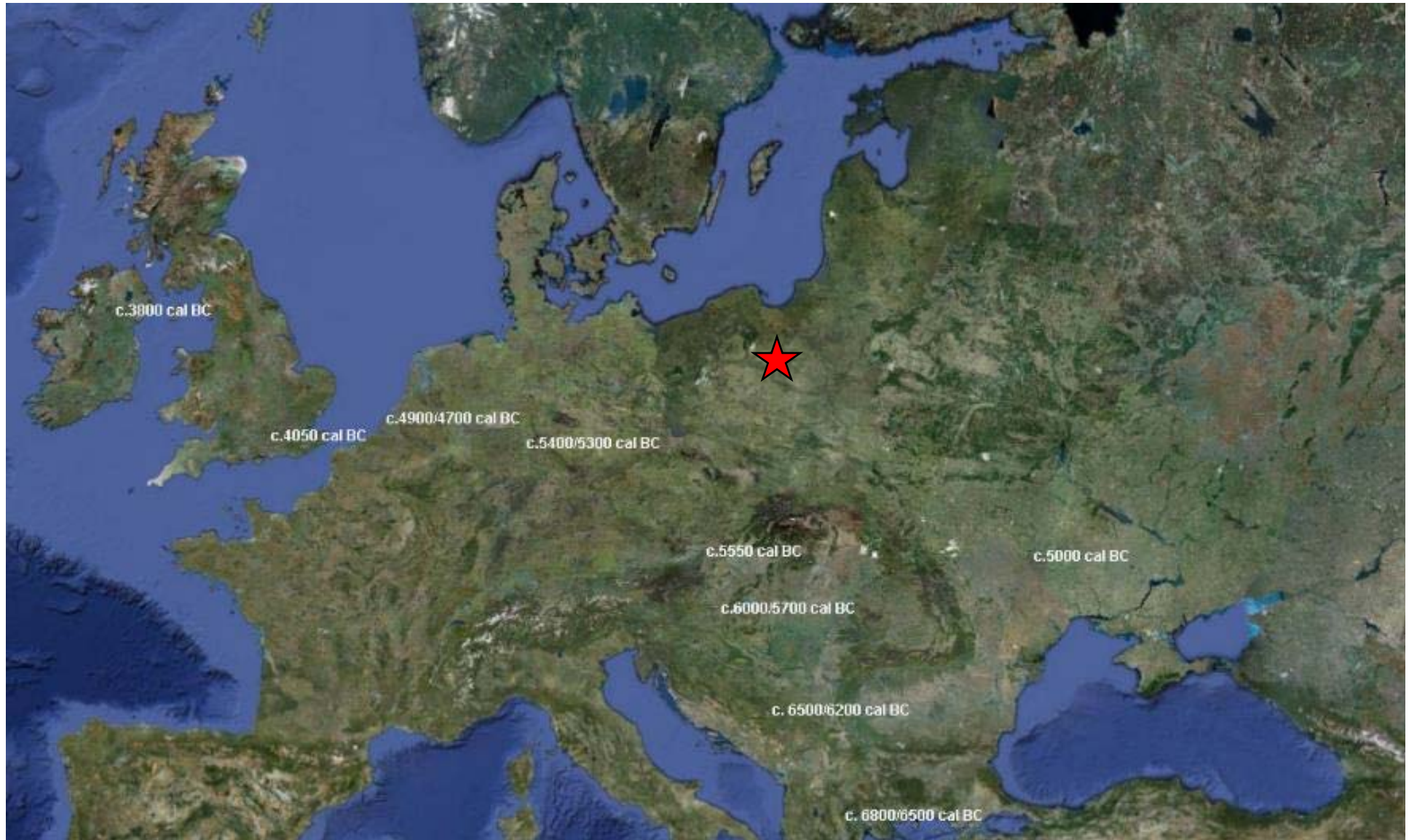
Dairying (and cheese production) taking place in central Europe by **late 6th millennium BC**

Evidence so far:

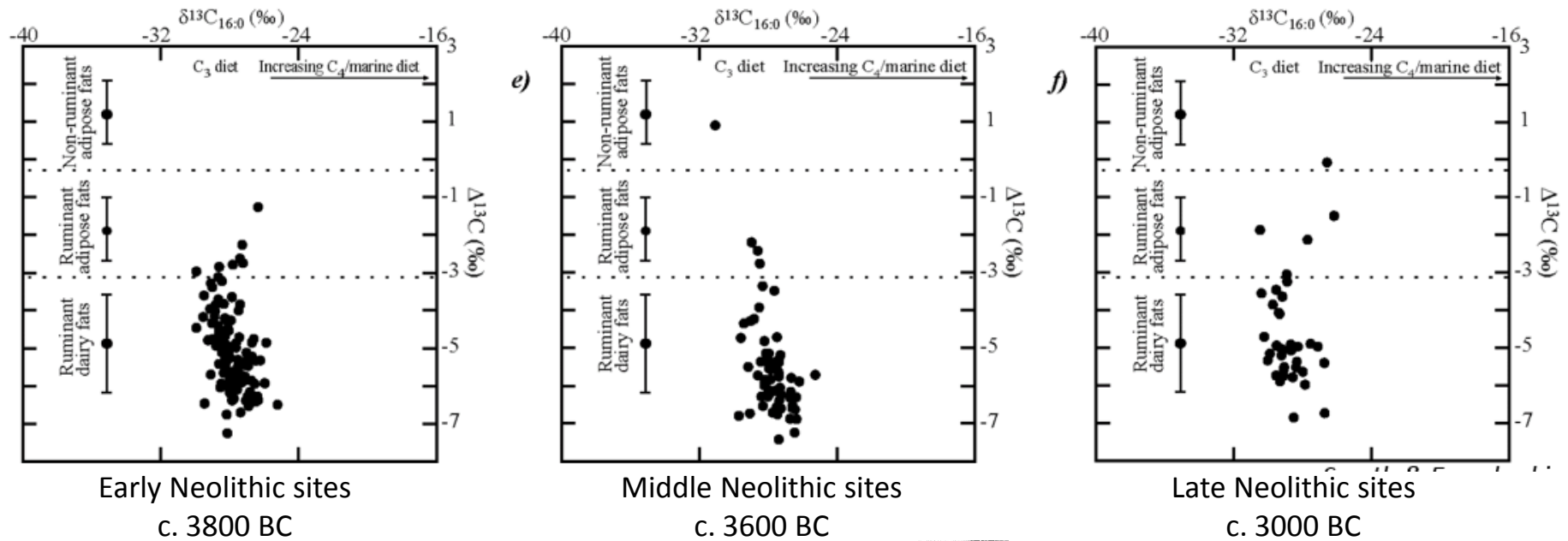
- specialised
- limited?
- regionally varied



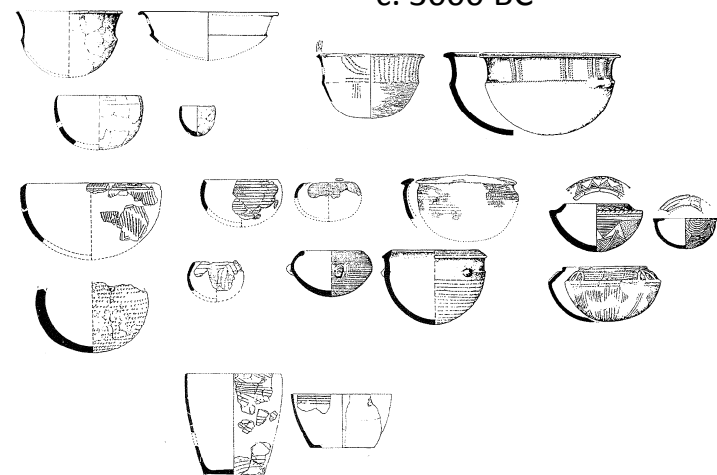
From Central Europe to Atlantic Europe...



Lipid residues from Irish Neolithic pottery



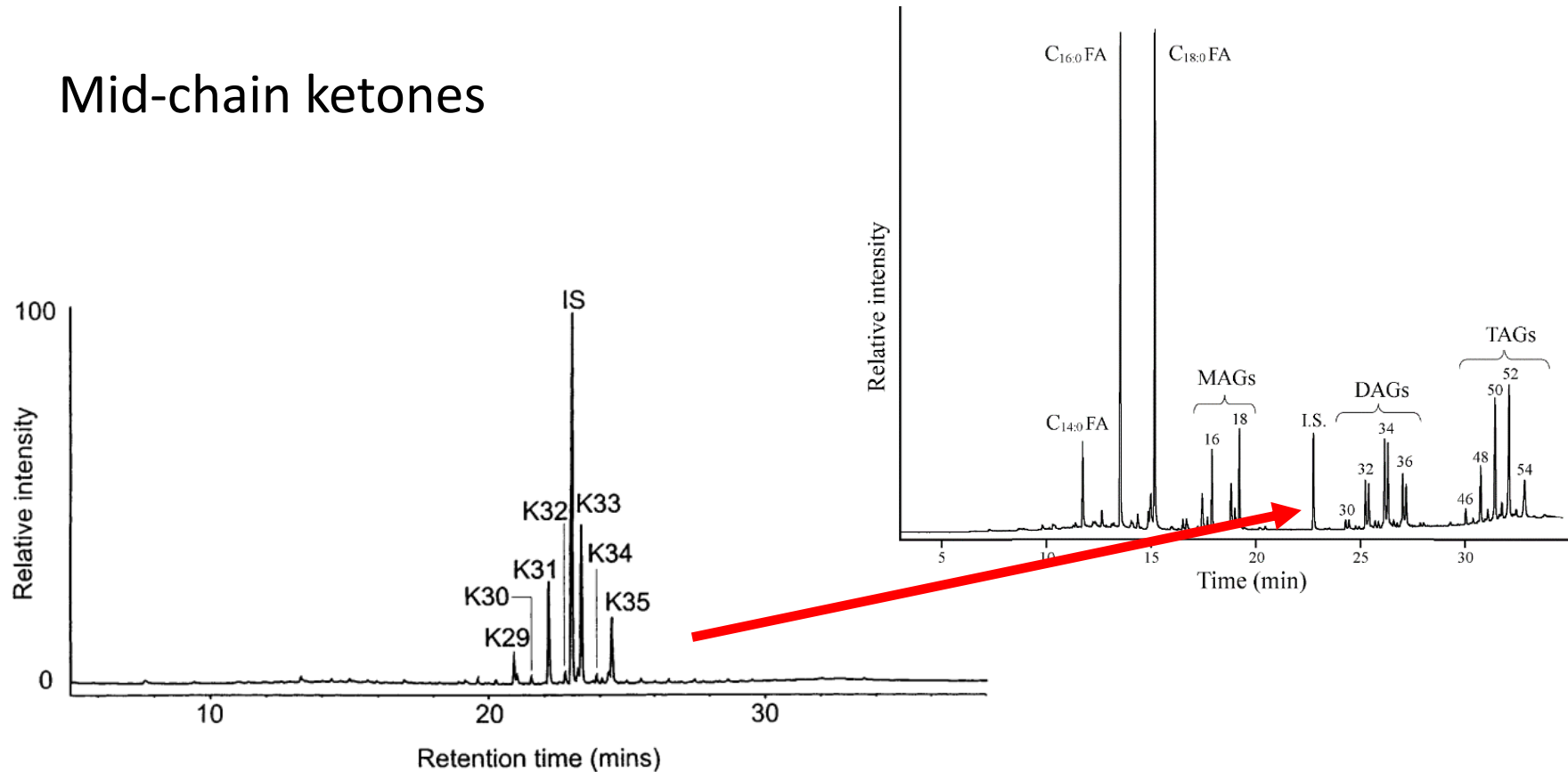
- Values for over 200 Neolithic pots
- 90% of samples had dairy fats as predominant fat type
- Dairying is one of the earliest farming practices in Ireland



Smyth & Evershed. 2015. Milking the megafauna: the role of organic residue analysis in understanding early farming practice. *Environmental Archaeology*

Cheese in prehistoric Ireland?

Mid-chain ketones



- Formed at temperatures >270 degrees celsius
- Present in 40% of the Irish pottery lipid residues

Lactase Persistence (LP) and ancient DNA

New aDNA evidence from Ireland

PNAS

 CrossMark
click for updates

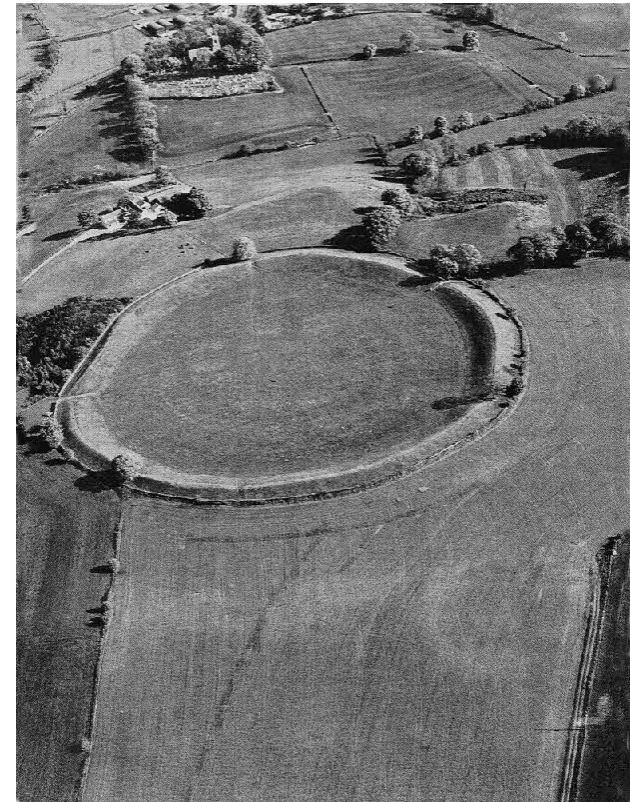
Neolithic and Bronze Age migration to Ireland and establishment of the insular Atlantic genome

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The Neolithic and Bronze Age transitions were profound cultural shifts catalyzed in parts of Europe by migrations, first of early farmers from the Near East and then Bronze Age herders from the modern data (4–10). In Europe, these clearly show population replacement by migrating farmers from southwest Asia at the onset of the Neolithic with some retrenchment of the earlier Mesolithic



Giant's Ring, Ballynahatty, Co. Down

Middle Neolithic burial from Ballynahatty
Female, black hair, brown eyes

Lactase non-persistent



Same picture emerging across Europe –
LP not visible in populations until
Bronze Age/Iron Age

Significance of dairy products in prehistoric Ireland



Final stages of a bullock's journey from *Inis Oírr* out to steamer *Dún Aengus* for transport to Galway, May 1939
(© National Library of Ireland)



Bringing a cow in a *naomhóg* to the Blasket Islands, 1935
(© National Folklore Collection, University College Dublin)

Island environment, with no native wild predecessors

Shipped across sea

Earliest dairy farmers could not digest milk; cheese and other low-lactose products **crucial**