Intro:
　　A friend and I have been casually playing 0AD for a number of months and have been enchanted with the gameplay, graphics, and amazing sense of community and co-creation that has come together to create this project. In this spirit, we'd like to offer these suggestions of how the gameplay could be subtly improved in a few ways. In a nutshell they involve user/Gaia interactions, resource gathering, and civ-specific agro-economy models and techs.

- simple modifications to user/Gaia interactions
- simple modifications to agriculture structure and research names
- call for diversification of Gaia plant and animal food sources
- call for civ-specific diversification of agriculture structures and techs

　　IRL, our work in life is nature and ecology education and research at local public schools and universities, and non-profit management focused on public fruit and berry growing - so you can see the focus of our inputs ;). This is our first post on the forums, and we're hoping we landed in the right place. More connected members of the dev team are welcome to dissect this list if inspired and cross post where most applicable.

Rationale:
　　Any societies' agriculture, economy, and military were and are inseparable, past and present. . In a sense, armies were, and are extensions of a culture's farms, far removed. In addition to nutrition and calories and energy literally fueling societies during peace and war, farms furnished many, almost all, of the material goods used in the economy, with the exception of quarried rock and forest-cut wood. Materials like leather, insulation (wool, flax), cloth, dyes, fibers, solvents, adhesives, medicines, preservatives, small diameter wood, oils, paints, poisons, and more all are first grown on farms, and often processed nearby.
　　While 0AD largely focuses on military conquest, a little bit of tweaking, even just of the names of farming units and structures in the game, will go a long way to honor the importance of agriculture in all aspects of history, show the dynamic and unique nature of different societies' forms of farming, and possibly educate and inspire players. Without further ado, here are our suggestions.

1. Suggested increase of diversity of berry/nut bushes, fruit/nut trees:
In a game striving for historical accuracy, and with a fair diversity of tree models (and countless accurately rendered civ-specific warrior models) there should be more diversity and accuracy in the berry patches. With ancient Carthaginian names for fishing boats (which is awesome), merely one "Berry bush" feels out of place and too simple.
　　Easy and basic modifications of the existing berry bush model would suffice for most of these, or at minimum, just name changes of the same model, differentiated across for tile-sets. Biome: temperate (temp), northern (north), southern Europe (s.eur), south Asia (s.asia), arid (arid), Mediterranean (med). Appearance indicates how the berry bush model might be easily modified.

Name	Biome	Appearance
berry bush model mods:		
bilberry	temp, north	blue, small berries (like a blueberry)
blackberry	temp, s.eur, med	shorter bush, silvery foliage, small black berries
aronia	temp, north	darker green foliage, dark purple berries
elderberry	temp, north	tall bush, light green foliage, clusters small black fruit
gooseberry	temp, north, s.eur, med, arid	red, small berries

black currants	temp, north, s.eur	black, small berries
sea berry	med, arid, s.asia	orange, small berries, dark green/silver leaves
sloe plum	north, temp	purple, small fruit, dark leaves
pomegranate	arid, s. eur , s. asia, med	tall berry bush, darker foliage, larger red fruits
hazelnut	temp, north	tall bush, darker foliage, brown nuts in light green husks

fruit trees that could use the apple tree model, modified:

rowan	temp, north	apple tree with darker foliage, clusters of orange fruit
hawthorne	temp, north	apple tree with darker foliage, dark red fruit
medlar	s. eur, med	smaller apple tree with darker foliage, dark orange fruit
quince	temp, s.eur, med	smaller apple tree with light foliage, yellow fruit
almond	arid, s. euro, med, s. asia	short tree, small green/yellow fruit with 1 brown stripe
apricot	arid, s. euro, med, s. asia	short tree, orange fruit (same model as above)
wild pear	all but arid	medium tree, dark green glossy leaves, orange grn fruit
cherry	north, s.euro	medium tree, dark leaves, purple red small fruit
persimmon	s. asia, med, s. euro	med tall, thin tree, drk grn leaf, large orng. fruit, blk bark
mango	South Asia	taller apple tree with glossy dark leaves, orange fruit
citrus (lemon?)	s. asia, med, s.euro, arid	apple tree with glossy dark leaves, orange/yellow fruit
mulberry	all maps	med size, wide tree with y/g leaves, y/br bark blk fruit
jujube	S. asia, arid	med tree, red small olive like fruit
pistachio	S. asia, arid	med tree, beige small olive like fruit, tan bark

other models:

morel	temp, s. europe	small patch of mushrooms (low, grey/brown)
chestnut	temp, s. eur, north	med tree, dark green leaves, bright gr husks, brown nuts
walnut	temp, s. euro, central asia	tall tree, green long leaves, bright gr husks
sugar apple	S. asia	medium cone shaped tree, large leaves, large green fruit
tamarind	S. asia, arid	tall tree (use tamarisk model), long dark beans.

2. Dry land, non-fruit, food gathering patches:
In addition to fruit, many wild tubers and greens played an enormous, supportive role in the peasant farm economy, on all continents, in all time periods from pre-history to the present day. From a caloric sense, wild starches were often gathered in excess of wild fruits, so we feel they should be represented.

Name	Biome	Appearance
wild yam	South Asia	pile of vines, glossy heart shaped dark leaves, ylw roots
burdock	Temperate	upright herb, broad dark leaves w silver underside
nettle	all (non-arid)	patch of upright, dark green thin herbs with little spikes
camas	Temperate	waist high grass looking patches w flowers, onion bulbs
orchid tuber	Arid	small, thick grass, small pink flowers
sea kale	temperate, northern	small cabbages, grows near shore, not in water
wild melon	Africa, Arid, Med	small pumpkin patch, orange

3. Wetland (shore and shallow water) food resources
    Wetlands (freshwater), habitats are especially productive, and were long used as sources of starches and greens, at all times of year including the winter, when the ground was usually frozen elsewhere. All players of 0AD regardless of nationality are descended from peoples who made use of wetlands plants as food, even up through the late middle ages. These shore or shallow waters based Gaia/flora models could be "patch" sized food gathering resources for villagers, accessible from shore,

as well as fishing boats (though their maximum water depth for growth should be about what people can walk in, maybe a little deeper.)
- They could all have as much food as a berry bush for simplicity's sake, but having a choice and more meager option for each biome might be of interest and additional learning value.
- The plant-based wetland foods and shellfish could use same animation as berry picking. Is there a fishing animation for civ. soldiers and women?
- Maybe these foods could be deposited at a dock, for convenience?

Name	Biome	Appearance
cattails	temp, north, south	tall grass in water with wider leaves, cattail fruits
bullrush	Temperate, arid	tall grass in water with brown thin seeds at top
water lotus	South Asia	large round leaves, white lotus flowers on stalks
pond lily	Temp, south, north	floating round leaves, yellow floating lotus flowers

Shallow-water, shore based catchable freshwater fish:

catfish	Temperate	Larger (football) fish with whiskers, dark color
eels	all	Longer, snake like fish, writing in rocks
salmon	Northern	jumping fish in small channels? appear cyclicly?
crawfish	Southern, Asia	Smaller, lobster like, with little mounds and holes
frogs	Temperate, S Asia, S Euro	lil' frogs, maybe a cattail or too and some eggs?
waterfowl	All	ducks, geese, nests with eggs, ducklings

Saltwater*

mussel bed	Temperate, northern	dark blue, oval shells on rocks
clam bed	South Asia, Med.	white round shells on sand, holes, small circling gulls?
seaweed (laver)	northern, temperate	rocks under/above water leaves
seaweed (sea lettuce)	temperate, south europe	green
seabird colony	All	gulls, cormorants with nests, eggs

*not sure how to indicate salt vs. freshwater in the map generation... would have to maybe be assigned to land tile beneath it? I'd say randomly generated placement on procedural maps would be fine, users can place their own if they want on custom maps.

4. Proposed villager/fishing-boat built structure - fish trap - a la Age of Empires II:
Used historically, and almost universally. Maybe could be built by villagers on shoreline, (like dock), but might clutter villager build UI. Could also be built by a fishing boat. Costs some wood, yields food, takes 1-5 workers like a farm or bush. Maybe a dock research in phase 2/3? Capture-able? Useable by all boats (enemy or allied?)
See: http://ageofempires.wikia.com/wiki/Fish_Trap

5. Proposed food from existing tree models that presently only yield lumber:
　　　IRL, these trees produce food and are (and were historically) as useful in orchards or wild sources of food as they were for lumber throughout history. Some are heavy producers, others have sparse harvests. Based on our understanding of production of these species, and measuring against the existing amounts of food offered by in game resources, we suggest the following food availability for these lumber trees. Additionally, some food producing trees should also yield a little wood when harvested out. However, there would need to be a seamless way for the player to decide (or not) which resource to harvest. Solutions include:

- villager preset (has toggle, like military formations for preferences)
- auto gather whichever you have less of (could be example of above preset)
- get all the food fist, then the wood
- get all the wood, then there is no food
- when mousing over the trees, you can pick those options in little pop-up
- villager gets both resources at the same time (but couldn't deliver food to the storehouse?)
- general preset for all workers at the storehouse or farmstead

Tree list and proposed relative food amts:
- acacia -little food (150F)
- apple - little wood (or becomes an apple/lumber tree after food harvested)
- baobab - food (400F)
- carob - food (250F)
- date palms - food and wood (400F)
- beech - little nuts food (250F)
- fig / little food and wood (500F, 150W)
- oaks - food (research?) considerable, far more productive than farm fields (500-1kF)
- pine - little food (150F)
- toona - little food (150F)

5. General corrections and suggestions for Gaia units, names:

- Lack of consistency in name selection for Gaia/flora. Propose the following format:

User region common name (Player-civ historical common name)
Latin name (Gaia)

Example (english language player playing as britons)   (Spanish language player playing as britons)
Oak tree (coden derw)   Roble (coden derw)
Quercus rubra (Gaia)   *Quercus rubra* (Gea)

- Tamarix is scientific (Latin) name, Tamarisk is English (Gaia/flora)
- musk-oxen are a New World species, and in recent years have been introduced to Eurasia only in Scandinavia. Not sure if they feature in historic campaigns. If they're in a randomly generated terrain (northern) with ancient civs... not such a big deal IMO.
- **The following Gaia fauna (carnivores) should be available as a food resourc**e. While not historically staples, they were certainly used in times of war or famine (such as the conditions of the entire game). Could get civ-specific for who could have broader diets, might be a fun small bonus for some civs (Mongols, later romans (feasts), Kushites, etc... but would be easier to implement edibility across the board and let players take the risk to fight them.)
  - Fox   20
  - Wolf   30
  - Croc   150   Historically eaten by ancient Egyptians (also revered).
  - Shark   200
  - Lion   150
  - Tiger   150
  - etc..

- **Gaia interactions:** Simple AI with carnivores hunting herbivores. Should be rare and not cut into the resources but would be fun and immersive and compelling to witness. Herbivores breeding every so often... would have to have local population limits (like maybe the deer population raises by 10% a minute (doubling every ~10 min), reaches a cap of 30 (random idea, but not to high so doesn't lag or overrun the map). Or, easier, theres a random (low chance) that every few minutes a deer spawns near some a group of 2+ deer. Or something.

- **Suggested Gaia adds: (new fauna units)**
  - geese and ducks (same model, geese paler and bigger). Food value ~ 50 lives on the shore.
  - caribou (new world) / reindeer (eurasia) - tamable, as deer/sheep
  - Crows (small black Gaia/fauna/hawk), come to dead hunted animals and war dead...? Peck around? Would be cool to see. Also vultures! Could just be part of the unit death / decay animation for simplicity... but might need to be randomly present, so they all don't show up at the same time and look like clones. Not sure how to do that.

- **Fun ideas:** Wild asian elephant tamable by Mauryan, that become worker elephants

6. Potential lumber trees to add to the Gaia/flora palette, of historic and cultural significance:
These trees are currently missing from the palette, and would need new/tweaked models.
- Temperate climate: maple, ash, willow, birch, alder
- Mediterranean: cedar of Lebanon, myrrh, hackberry (Lotus tree of the *Iliad*)
- Arid: mahogany, dragon blood tree (*dracaena cinnabari*), tamarind, ghaf tree, wild olive, myrrh
- South Asia: banyan, bamboo, jujube, mango, she-oak, neem, sacred fig

7. Civ specific ecological/other structures/upgrades:
These played significant roles in these societies. These would take much more modeling and game balancing, but we thought we'd suggest for fun.

- **Britons, Gauls (others?)** - a druid (or maybe takes a few at once) can plant a **sacred grove** (Oaks used historically for this) (X wood, stone?). Starts an oak tree -- might need a building / growing animation. Maybe has to be built ON existing trees? Has aura of effect healing speed increase? maybe vastly increases the healer's POV vision while they're standing next to it? Maybe generates deer slowly? If you sacrifice sheep there.... *insert fun effect* insta-heals 500hp (or whatever feels balanced) within the small radius, to the lowest HP units first?
  - https://en.wikipedia.org/wiki/Sacred_grove

- **Coracle** - Briton specific small, circular, portable, wheelbarrow sized boat. Developed interdependently by the Indians/Mauryans as well, today called haragōlu (Crab boat)). Built WITHOUT a dock, by citizens and citizen soldiers. Research at dock. Was used at the time of Cesar in Wales and the UK/Ireland. He noted them, and used them in his own Campaign in Ireland (so maybe some Roman soldiers could get them later, likewise with an upgrade (maybe at the military outpost, not dock), could not find a specific Roman military name for them, Latin for coracle is coracle). Builds fast (10-25 sec), costs 20-50, can be fished from or transport, and can be carried? Moves slowly. https://en.wikipedia.org/wiki/Coracle
  - https://en.wikipedia.org/wiki/Coracle

- **Qanat** Used historically and I believe presently in Iran. For Selucids, maybe Ptolemies? Place near farms, akin to rotary mill, maybe worker has to build a water entrance at nearby highlands

just for fun, or user clicks to identify or... just forget about that. these are basically highly efficient underground aqueducts for irrigation, still in use in Iran. Could be a research at storehouse, or farm field if not a full structure, but their architecture was beautiful, above and below ground.
  ○ https://en.wikipedia.org/wiki/Qanat

- **Cob structures/houses** - Britons, Gauls, probably lots. Town phase research (at houses?). decrease house and economic structures cost by 1 or speed (maybe if worked on in groups)

- I don't know enough about the rest of the civs to propose others.

8. Suggested mechanic for wild (plant) food harvesting, fish:
  The following could be a research, below, at the farmhouse, rather than a engine-wide mechanic. I think that would be easier. The in-game agro-economy offers, and reinforces, player concepts of how humans interact with the ecosystem. All too often in resource based RTS games, this is a consume-and-move-on paradigm. While this encourages expansion for in game conquest, it's not totally historically accurate, and paints a too-simple picture of human/ecology relationships.
  The fact is, that picking berries does not destroy a bush. People know that 200,000 years ago, and people know that today. In fact, people historically often chose to relate to berry patches in ways that PROMOTED the regrowth of the food plants. Some mechanic options are:

- **Easy mechanic:** Berry bushes, trees, fish slowly regenerate food (full bush takes ~5 minutes? long enough to encourage expansion as usual, but fast enough to eventually come back to.). If the available food reaches 0, the bushes die, representing unsustainable and irresponsible harvest. If you stop while they have some amount of food, they will survive and keep regenerating until full and you return to keep harvesting.
- **Research option:** Storehouse had a research (town phase?), **wildcrafting** that would automatically de-allocate foraging villagers when the patch was low: applies to bushes, shellfish, maybe not fish patches without an additional research. These would then have to be allowed to slowly grow back.
- Alternatively, berry bushes would NOT regenerate UNTIL you had researched wildcrafting.
- **Wildcrafting** could also allow women to plant berry bushes, fruit trees (random palette selection) anywhere, (within radius of existing berry bushes), for x wood /ea?

9. Storehouse technologies:
- **Billhooks** - basically hooked axes/knives for harvesting small wood. Used in self defense by peasants, and as weapons when levied into war. Developed on a long handle to "prune" limbs, and became the halberd. Maybe villagers that are harvesting wood get +X attack? Or all villagers do, for simplicity? Plus, they look awesome!
  ○ https://en.wikipedia.org/wiki/Billhook#Military_use

  Propose these upgrades get renamed for more historic detail and accuracy:
- Stronger Axe -> Hewing Axes (more specific) (or billhooks, above)
- Sharp Axe Heads -> Grinding Wheel (even iron axes were sharp).
- Baskets -> Pack Baskets (presently redundant with wicker baskets, and baskets have been around (pre scope of this game), for many 1000s of years, so "researching" them around 0ad seems strange.
  ○ https://en.wikipedia.org/wiki/Basket#History

Coppice forestry (costs TBD) (research in phase 1 or 2)

Coppice is a universally practiced, historic and present human wood gathering technology in which trees are cut in cycles, and each tree has a change to regrow over decades (or lower time frames) from multiple stumps. While some empires blatantly deforested the land, many gathered wood in a somewhat sustainable manner. While the need for active expansion in 0AD driven by wood depletion is part of the gameplay, coppicing was very fundamental to past (and present) local economies of any scale (village - empire), and I think should be represented in this game - not just for historical accuracy, but to offer a teaching tool to players, and to introduce players to this concept which has modern day implications. Here are some suggestions about how it might work.

- If a worker(s) is gathering wood, and the tree HP (wood qty) is hits 20, the workers are auto- reallocated to nearby trees. The tree dies, spawns a species specific (or even generic) coppice stump in its place. This stump starts with 20 wood, which could be harvested in an emergency, but regrow wood/HP to it's maximum (let's say 200) over 5 minutes, with the same feature - when it gets to 20 (or 0), the workers reallocate to nearby trees - either whole trees or coppice trees over ~50 or 100 HP, giving them some time to recharge.
  - There would be a need for an associated build animation for the coppice tree - growing as a stump with sprouts that finally become multiple, vertical thinner trunks. For the sake of easiness, maybe all trees re spawn as the coppice tree (same model), despite their original species. However, not all trees can be coppiced - evergreens cannot. Unlocks **woodlot management (below).**
- Or, more simply, below:

Woodlot management - available in the city phase. Lets civilians build a **woodlot (or copse)** (structure akin to a farm field, looks like lotsa stumps that grow to trees), about 5 **coppice trees** close together in a clump. The research costs wood, food, metal, the woodlots themselves cost wood and metal, stone, whatever. This could have to be built OVER (or UNDER?) existing trees, stumps, or just fields., but would be gather able, as is food, in a sustainable, somewhat endless way like a farm field. The # of workers per woodlot could be tweaked, or their rate of gathering. Maybe then you have to harvest the original trees, then you get the woodlot. Maybe the woodlots have infinite wood, maybe they have 1000, 2000, etc. or maybe you'd need to let them rest somehow.
- https://en.wikipedia.org/wiki/Coppicing

10. Farm field renames:

Not all these factions consumed the same staples. While "Field" is generic, having the species (here simplified - many cultures consumed many grains, vegetables, etc), listed int he name increases the learning and immersion for the player.

Civ	Field	Civ name
Athenians	Barley field	
Britons	Spelt field	
Carthaginians	Wheat field	
Gauls	Spelt field	
Iberians	Wheat field	
Macedonians	Wheat field	
Mauryans	Rice field	

- Persians   Barley field
- Ptolemies   Barley field
- Kushites   Millet field
- Romans   Wheat field
- Seleucids   Wheat field

11. Farmstead Technologies (researchable):

- **Nut processing** (nuts) - lets you get food from (oak, beech, *chestnut, almond, (italic not in game atm)*. Simple solution is that it turns the above models into food versions (replacing lumber versions) for the researched player. Simpler still is that all civilizations have this ability to begin with, it's not an upgrade, but these tree models produce food and players have the choice. More complex is that player has a choice of resource. If choosing food/wood (in the GUI) feels to much work and might slow gameplay a little, maybe the default could be getting wood, and a hovered mouse over over the trees will pop up a food option.

- **Wildcrafting** (lets women replant berry patches, or not exhaust them when they get to zero food but they (very?) slowly come back?)

- **Herbalism** - slightly increase women hit points (5-10?), walking speed, and add healing radius (slow hp/s for around women and certain units - like maybe villagers and citizens soldiers? maybe if near a house too?). Or maybe is like battlefield medicine, but ALL units regenerate a little bit more?

Hedgerow - played a critical role in the home economy of peasant farmers across history. Basically quasi-wild but cultivated strips of bushes and trees between farm plots, full of bushes with food, medicine, nutrition, fiber, useful fuel and more. Suggested here as a farmhouse, phase 2 upgrade available to all non-arid civs, that unlocks a build able structure, the **hedgerow.**
- built by citizens like a palisade, 4 or 5 units long. passable, but briefly slow movement through them for foot units, slow cavalry less, can't stop siege. can be destroyed., lower HP than palisades. however, can gather some amount of food off of them. can only be built along the edge of a farm.
- Or built on farms/adjacent to farms, (add ons), like the nuke silo to the Terran CC in StarCraft. Not sure if the farm or villager would do the building. Maybe, more simply, any farm could research "Add hedgerow", (the way that towers can upgrade to defense towers), and it would allow another 1-2 workers to farm there, and change the model to have a few bushes along the edge (or not). This way it doesn't deal with it as a defensive structure.

12. Propose these upgrades get renamed for more historic detail, accuracy, and intrigue to player.
- **Gather training** -> **Cover Crops** or Crop Rotation (civ specific), propose icon is a seedling plant (could be same across the board), and have the name format: Cover Crops (Barley) or Crop Rotation (Barley). Alternatively: [civ historical name] ([Player language] cover crops), i.e. Shaftal (Barley Cover Crops). It may be easier NOT to include civ names for this for simplicity.

Civ	Tech	Historic name (incomplete list)
Athenians	Lentils	

- Britons   Winter rye
- Carthaginians   Cowpea
- Gauls   Winter wheat
- Iberians   Barley
- Macedonians   Spring oats
- Mauryans   Mustard
- Persians   Clover   shaftal
- Ptolemies   Lentils
- Kushites   Sorghum
- Romans   Chickpeas   cicer
- Seleucids   Sesamea

Civ specific researches (names) for last tier (3) farming speed upgrade

- **Fertilizer** - > Rename to civ-specific final tier farming tech. Below are a more complete list of civ-specific, geographically unique and HIGHLY sophisticated agricultural technologies of antiquity (often still used to this day).
- This could change the name of all their fields to this specific type.
- Different models would be amazing, but recognized as being a design challenge.
- The upgrade could (easily) just be the additional % increase to food, but some careful scholarly research might uncover some interesting ways in which these profited the militaries (or economies) of the playable societies. This could give late game, economy specific, agriculture activated society wide upgrades, which would be very interesting to see.
- Alternatively, each civ could have a (different modeled) civ specific agriculture aura-enhancement building, like rotary mill, that can upgrade farms in the vicinity (or map-wide)

Civ	tech (english)	Civ specific name
Athenians	olive press	
Britons	chalk fertilizer	
Carthaginians	Seasonal herding	
Gauls	Sprouted einkorn	
Iberians	Pig-oak silvipasture	Dehesa
Macedonians	vineyards	
Mauryans	Fair farming administration	Kumara
Persians	Qanat irrigation	
Ptolemies	Cotton cultivation	
Kushites	Tilapia Aquaculture	
Romans (Republican)	Master beekeeping	
Seleucids	Long distance herding	

If all this sounds too much, **Fertilizer** could become **Fertilizer (X) or X Fertilize**r, as below, using a regionally specific source of the resource. That option is listed below, is recognizable across playable civs, and honors the differences between these societies modes of farming.

Athenians	Fertilizer (Charcoal)
Britons	Fertilizer (Chalk)
Carthaginians	Fertilizer (Reed mulch)
Gauls	Fertilizer (Oat straw)

Iberians	Fertilizer (Pig manure)
Macedonians	Fertilizer (Leaf mulch)
Mauryans	Fertilizer (Cow manure)
Persians	Fertilizer (Wheat chaff)
Ptolemies	Fertilizer (Cow manure)
Kushites	Fertilizer (Reed mulch)
Romans	Fertilizer (Cow manure)
Seleucids	Fertilizer (Barley chaff)

13. Corral - tech and trainable livestock:

- **Poultry**: geese, peahens, guinea fowl, ducks, chickens, made in batches of 5? (Maybe just "poultry", and it's civ specific: Geese for northern/central europe, ducks for western europe, chickens for mediterranean, guinea fowl kushites, pea hens /cocks for western/south Asian factions and high Romans. Or random. Maybe 1-20 poultry can be garrisoned IN the corral, which women can get eggs from (maybe 5? less? people can gather at a time, rate of replenishment or amt of women able to gather depends on amount of garrisoned poultry, each of which cost food one time). Would be similar production to a farm, but less space, and could cost more food than farm wood to earn for that benefit.
- **Cattle:** cows, water buffalo, zebu
- **Horses:** eaten by some cultures, include donkeys
- A quick survey of the in-team historians should yield which civs get which livestock. Maybe they all just get one? Or maybe in city phase, the price drops on cows, etc, and they have a better pay-off? Or maybe animal food cost drops by 1 for each farm field you have?
- **Pigs:** Iberians, Romans
- **Carthage, Selucids, Persians, Ptolemies:** Camels, goats

Corral features
- **auto-train (on loop) single/batch livestock** to workers nearby harvesting meat. Maybe stops the auto-cue when food is low and during alerts? Maybe made when workers are harvesting it but it's the last one dies? (This can be toggled on/off)
- **livestock reproduce** over time (if 5? or more, and are idle long enough)
- **sheep can be tamed** by women, as in, can follow them back to the farmstead for easy meat shuttling a la Age of Kings.
- **Sheep, goats, cows, camels**, can be milked (one woman per cow/sheep). Does not kill it but allows for continuous, albeit slower production. research "dairy / stanchions / milking stool" or something like that at the corral. This option (cursor / mouse over) would have to be elected by the villager when selecting the sheep.

14. Possible Kennel researches for increased dog utility
- herding - allows dogs to go roaming for meat to chase (have livestock or game follow the dog) back to the kennel, or dog brings it back to a corral or farmstead.
- retrieving - dog explores map, looking for poultry, kills, brings back.
- hunting dogs - follow horsemen to hunt, increase qty of meat yielded from the carcass, or makes deer or geese, etc, spawn randomly at times near the hunters ("flushed" out of the bush)
- morale - units with dogs have "morale" higher --- faster healing rate?

15. Artistic suggestions for some Gaia units / icons:

- Mushrooms - should be bigger, or have shadows around them to stand out in landscape.
- Larger oaks, pines. Should not be same size as palm, but twice as big.
- Toona tree needs more red leaves, for tropical (S. Asian biome only).
- Rhino has bear for icon pic, has badger head.
- species specific fish icons missing

16. General game / scenario editor suggestions:
- Have a tool in Scenario Editor that can paint flora (or units, for that matter) with a wider brush, and can be held down (spray paint style)
- Have "select unit" feature in Scenario Editor, to indicate name and maybe starting parameters for that model (or all copies of it)
- Have visible "elapsed time" counter in game replay mode (and possibly in active game modes)
- Have a test / launch map feature directly from Scenario Editor
- Flaming fauna animations (after burning pig contact) need some work, maybe not realistic that units catch fire and DoT from the pigs.
  possible able to have them rendered, could try to mod them as units but not my forte. would be fun, but... anyone interested in tagging in?
- Middens, like the treasure chests, and random item drops (trash mounds from prior cultures - stone, metal?), were historically used.
- camera angle changeable (if desired) from 45deg down to adjustable, including 90deg (towards horizon), or less, so that the ground isn't dis-oreientingly lost. Maybe also able to look straight down if desired.