

# 11. The Indo-European vocabulary of dairy products

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## Abstract

The following preliminary historical-comparative investigation of the Indo-European terminology pertaining to dairy products leads to the conclusion that while the words for the ‘cow’ and the process of ‘milking’ belong to the basic vocabulary, a common word for the substance ‘milk’ cannot be safely demonstrated. On the other hand, at least Core Indo-European possessed a rich and subtle vocabulary for the processing of milk into curds, butter and cheese. The lack of a widespread designation for ‘animal milk’, which must surely have existed by the time of the proto-language, is rather puzzling. Even though missing evidence is certainly no proof in itself one might hypothesize that the reason why the word for such an important element of a pastoralist society was not faithfully preserved as part of the stable common cultural vocabulary like, e.g., ‘cow’, ‘sheep’ or ‘wool’ was a restricted use of unprocessed milk for human consumption in the oldest period. At least recent archaeobiological observations suggest that lactose tolerance only developed gradually after the disintegration of the Indo-European unity.<sup>1</sup>

## 1. Introduction

In early Indo-European pastoral societies the importance of cattle, notably cows and sheep, can hardly be overestimated, and we find

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<sup>1</sup> As observed by Martine Robbeets p.c. (cf. Robbeets et al. 2021), a similar situation is found in non-Indo-European populations with low lactose tolerance such as the Mongols and Kazakhs. With the Mongols, whose ancestors were originally millet farmers, pastoralism and dairying was a relatively young invention, and hence there is a connection between the words for ‘milk, milking’ and vegetal fermentation.

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innumerable traces of this defining cultural feature in the inherited vocabulary as such as well as in the linguistic evidence for the economy, sacrificial practices and mythology.<sup>2</sup>

It is, however, remarkable that while the indigenous words for ‘cow’, ‘sheep’ and ‘wool’<sup>3</sup> may safely be traced back to Proto-Indo-European, including Anatolian, and a verbal root meaning ‘to milk’ at least to Proto-Indo-Tocharian, defined as the period after the first split of Anatolian, solid evidence for a common term for the basic substance ‘milk’ is hard to find. On the other hand, a more specialized terminology for processed milk products abounds, as noticed in the brief survey by Mallory & Adams (1997: 381–383).<sup>4</sup>

## 2. The cow

The importance of the domesticated cow in Indo-European society is undisputed, and the corresponding common term *\*g<sup>w</sup>ōus*<sup>5</sup> is safely attested in all branches with the possible exception of Albanian,<sup>6</sup> cf. e.g. Hieroglyphic Luwian *wawa-*, Tocharian A. *ko*, B *ken*, Latin *bōs*, Umbrian (acc.) *bum*, Old Irish *bó*, Old Norse *kýr*, Old English *cú*, Old High German *chuo*, Mycenaean *qo-u-*, Greek *βοῦς*, Armenian *kov*, Vedic *gauḥ*, Avestan *gāuš* and Latvian *gūovs*.

Slavic *\*goveđo* (n) ‘(head of) cattle’ with continuations in Russian (dial.) *govjádo*, Czech *hovado*, Serbo-Croat *gòvedo*, Slovene *gověđo* and Bulgarian *govédo* undoubtedly contains the same root though the exact stem formation is considered obscure. As is often assumed (cf. e.g. Derksen 2008: 181), the most likely partial explanation would be a derivative in *\*-nt-*, common in animal names of the type Old Church Slavic *telet-* ‘calf’, Greek *κεμάς*, *-άδος* ‘hind’.<sup>7</sup> However, how to arrive at the *d*-formation is more obscure.

To this question, Trautmann (1923: 94) simply stated: “die Bildung des Kollektiven *\*goveđo* ist unklar”, while Berneker (1924: 338) assumed

<sup>2</sup> The work on this paper was supported by the project *Language and Mythology in Prehistory*, funded by Riksbankens Jubileumsfond.

<sup>3</sup> Cf. Olsen 2018 and 2023 with references.

<sup>4</sup> Cf. also Mallory & Adams 2006: 261–262.

<sup>5</sup> The precise reconstruction and morphological interpretation of the word is disputed, cf. NIL 189–195 and the recent treatment by Nielsen Whitehead 2018 with references. However, this question is not directly relevant to the present survey.

<sup>6</sup> The background of Alb. *ka* ‘castrated bull; ox’ is unclear, cf. Demiraj 1997: 210 and Orel 1998: 160.

<sup>7</sup> On the regular development of *\*-ñt-* > Greek *-άδ-*, cf. Olsen 1989 and 2004: 221 and van Beek 2017.

that a *d*-formant had been added to an *n*-stem reminiscent of animal names in *\*-n-*. Vaillant (1974: 490) suggested a stem in *\*-ēn-*, extended by *\*-d-* that would first yield a collective, from which a singular neuter would have been secondarily created. Finally, Derksen (l.c.) confines himself to conclude that it is unclear why we find *\*-do-* instead of *\*-t-*.

The idea of including a collective in the explanation is widespread, cf. Snoj (2003: 185) who simply describes Old Slavic *\*govędo* as a collective despite the clear singulative meaning ‘head of cattle’ in the individual languages. More accurately, Skok (1971: 596–597) talked about a Proto-Slavic collective *\*govenda* ‘boves’, which would make the neuter the corresponding singulative, as also implied by Vaillant.

The question is now how to envisage such a collective, and how to integrate the semantic development in a scenario that would also explain the enigmatic *-d-*. Here I would suggest something along the following lines:

- (1) a basic singulative *\*-nt*-stem *\*g<sup>w</sup>ou<sub>̃</sub>-nt-* would have the expected meaning ‘a single cow’
- (2) subsequently this *-nt*-stem was the basis of a collective “Hoffmann-formation” *\*g<sup>w</sup>ou<sub>̃</sub>-nt-h<sub>3</sub>ōnh<sub>2</sub> > \*g<sup>w</sup>ou<sub>̃</sub>-nt-h<sub>3</sub>ō(nh<sub>2</sub>) > \*g<sup>w</sup>ou<sub>̃</sub>ndō(n) > \*govęda* ‘group, herd of cows’ where the basic stem formation is no longer transparent in the nom.sg., the only surviving form of the paradigm, and the *n*-stem inflection is therefore no longer preserved
- (3) finally, this collective would trigger the creation of a new neuter singulative *\*govędo* ‘a single head of cattle’, whence the attested forms in the individual languages.

The development *\*-ō > -a* in the nom.sg. appears to be regular and synchronically identical with the neuter nom.acc.pl. ending *\*-ah<sub>2</sub> > -a*, while the assumed voicing of *\*t > d* by the following *\*h<sub>3</sub>* of the “Hoffmann suffix” would constitute a parallel of Welsh *afon* ‘river’ < *\*h<sub>2</sub>ap-h<sub>3</sub>on(h<sub>2</sub>)-* as famously analysed by Hamp (1972). Finally, the collective meaning in a “Hoffmann-type” substantive/determinative compound – as opposed to the usual type of adjectives/bahuvrīhis – would among other examples also be matched by *afon* with an original meaning ‘mass of water’ rather than simply ‘having water’.<sup>8</sup>

<sup>8</sup> Cf. Olsen 2010 on the distinction between the two subtypes of Hoffmann formations.

Naturally, most of the rich vocabulary pertaining to milking and in theory dairy products may refer to sheep, goats and perhaps horses as well as cows, but as may be gleaned from the role played by cows in the economic and mythological universe of the early Indo-Europeans it seems obvious that they must have been of primary importance.

### 3. Milking

A verb based on the root *\*h<sub>2</sub>melǵ-* meaning ‘to milk’ (IEW 722–723; Mallory & Adams 1997: 381; LIV 279) at least goes back to Proto-Indo-Tocharian. It is widely attested in all branches except Anatolian, Indo-Iranian and Armenian:<sup>9</sup> Tocharian A ptc. *mālkant-*, Latin *mulgeō*, *mulsi* with the secondary meaning ‘wipe, rub’, Middle Irish *bligim*, Old English *melcan*, Old High German *melchan*, Greek ἀμέλω, Albanian *mjel*, Lithuanian *mélžu* and Russian Church Slavic *mōlzu*. The ablaut difference between e.g. Greek ἀμέλω- < *\*h<sub>2</sub>melǵ-* and Middle Irish *blig-* < *\*h<sub>2</sub>mlǵ-* points to an archaic root present.

In Indo-Iranian, however, a different root is used to designate the notion of milking, viz. *\*d<sup>h</sup>eug<sup>b</sup>-* or *\*d<sup>h</sup>eugH-* > Indo-Iranian *daugh-* (IEW 271; Mallory & Adams 1997: 614; LIV 148).<sup>10</sup> The Vedic intransitive *duhé*, *duhré* (EWAia I: 747) has the meaning ‘give milk’ as opposed to the transitive *dógdhi* ‘milks’ (cf. also Middle Persian *dōxtan* ‘to milk’), also more broadly ‘extract’, mostly fluids, e.g. semen from a bull or the juice of a plant; another important form is the perfect *dudóha*.

The most obvious external verbal comparandum is the Germanic preterito-present continued in Gothic *daug*, Old English *dēah*, Old Saxon *dōg*, Old High German *toug* ‘is useful, fit’, an old perfect corresponding to Vedic *dudóha*.

Other cognates are Old Irish *dúal* ‘natural’, probably from a zero-grade verbal adjective *\*d<sup>h</sup>ug<sup>b</sup>-tló-*,<sup>11</sup> as opposed to the full-grade instrument

<sup>9</sup> Armenian uses the denominative verb *kʻtēn* ‘gather, reap’, but also ‘milk’. Here, the root *\*h<sub>2</sub>melǵ-/h<sub>2</sub>mlǵ-* would yield *\*amelǵ-/amatǵ-* that, both in verbal and nominal formations, would perhaps have been felt uncomfortably similar to *matǵ* ‘gall, bile’ with the opposite connotations, as in Shakespeare’s “take my milk for gall”.

<sup>10</sup> The further atomizing analysis by Garnier, Sagart & Sagot (2017) of the Vedic s-stem *dóhas-* < *\*d<sup>h</sup>eug<sup>b</sup>e/os-* ‘milking’ as *\*d<sup>h</sup>eh<sub>1</sub>-u-g-h<sub>2</sub>-e/os-* ‘sucking (mother’s milk)’ seems unnecessarily complicated, quite apart from the fact that the root relates to animals, not human babies.

<sup>11</sup> Traditionally *\*d<sup>h</sup>ug<sup>b</sup>lo-*, cf. LÉIA D–208. This is still a possibility, and it is true that cases like Old Irish *focul* ‘word’ < *\*uok<sup>w</sup>tlo-* would seem to contradict a reconstruction *\*d<sup>h</sup>ug<sup>b</sup>-tlo-*. However, it seems that while restitutions often occurred, clusters of the type *\*-CtI-* would regularly have been simplified already in the

noun \**d<sup>h</sup>éug<sup>h</sup>-tlo-* > Sanskrit *dogdhra-*, Middle Persian *dwl* ‘(milk) pail, bucket’ with the Armenian loanword *doyl*. Further, e.g., Lithuanian *daũg* ‘much’, possibly \**d<sup>h</sup>ouǵ<sup>h</sup>ó-*, originally ‘streaming in abundance’ or the like as the adjectival counterpart of Vedic *dógha-* (m) ‘(stream of) milk’.<sup>12</sup>

On this basis, it would be possible to make a case for a basic meaning ‘be prolific, stream abundantly’ (→ Germanic ‘be useful’) with a corresponding transitive ‘extract (a liquid), make stream’, especially about milking since milk would have been the liquid natural resource par excellence. Nevertheless, a semantic narrowing in Indo-Iranian from ‘be useful, prolific’ to ‘provide milk’ would still be an option.

However, a problem arises if it is assumed that the Greek verb *τεύχω* ‘manufacture, accomplish, produce’ must necessarily fit into the strait-jacket of a joint verbal complex. According to Kümmel (LIV 148–149), the basic root meaning would be “treffen” with a corresponding stative “taugen”,<sup>13</sup> and both *τεύχω* and *dógdhi* could be considered oppositional factitive formations, ‘make fitting’. Beekes (2010: 1475) maintained the close connection between Greek and Indo-Iranian and attributed a more original meaning ‘hit the mark, meet’ to the root in view of the nasal present *τυγχάνω* ‘achieve an aim, encounter accidentally’. Finally, Mayrhofer (l.c.) prudently concluded his treatment of the Indo-Iranian material with the verdict: “Weitere Zuordnung von iir. \**d<sup>h</sup>aug<sup>h</sup>* ist schwierig”.

Now, as is also commonly acknowledged (e.g. LIV l.c., note 3 and 10), the Greek forms must to some degree have been contaminated with derivatives of the root \**teuk-* ‘hit’ (LIV 640–641), cf. e.g. *τύκος* ‘hammer’, pf. *τέτυκον* ‘made’, Old Church Slavic *tykati* ‘thrust’. Thus, it seems most reasonable to establish the original root meaning on the basis of extra-Greek material.<sup>14</sup>

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proto-language, cf., e.g., Latin restituted *iugulum* ‘collar bone’ (root \**ieug-*) vs. regular *pālus* ‘post, stake’ (root \**pag-*; cf. Nielsen 1998: 97–98). Seen in this light, primary deverbative \*-*lo*-derivatives would be quite rare, while accented \*-*tló-* with zero grade in the root are either verbal adjectives – as may be the case here – or or substantivized neuter verbal abstracts.

<sup>12</sup> RV 5.15.5: *úrum dógham dharúnam ... rāyáḥ* ‘(as you give) as your milk broad support for wealth’ (translations of the Rigveda according to Jamison & Brereton: 2014). Alternatively, Geldner connected *úrum* with *dógham*, translating “einen breiten Milchstrom”.

<sup>13</sup> This was assumed to be the basic meaning by Kümmel 1996: 62.

<sup>14</sup> A formation of special interest is Greek *τύχη* ‘luck, (good) fortune’, which has been considered a direct match of Vedic *kāma-dúgha-*, ‘letting the (objects of) desires

The interpretation of the root is potentially relevant for the understanding of the Indo-European word for ‘daughter’, reconstructed as *\*d<sup>h</sup>ugh<sub>2</sub>-tér-*.<sup>15</sup> Incidentally, this is the only basic kinship term that can be safely projected back to Proto-Indo-European, including Anatolian (though here a secondary derivative), and with continuations in all branches except Albanian. Cf. Hieroglyphic Luwian <sup>filia</sup>*duwa/itarali-*, Lycian *kbatra*, Tocharian A *ckācar*, B *tkācer*, Oscan *futír*, Gaulish *duxtir*, Gothic *dauhtar* etc., Mycenaean *tu-ka-te-re*, Greek θυγάτηρ, Armenian *dustr*, gen. *dster*, Vedic *duhitár-*, Old Avestan *dugadar*, Lithuanian *duktė*, gen. *dukteš* and Old Church Slavic *dǫšti*, gen. *dǫstere*. The original status of this term is secured not only by its wide distribution, but also by its archaic-looking morphological character:

A handful of kinship terms are characterized by a final segment *\*(-h<sub>2</sub>)ter-*: besides *\*d<sup>h</sup>ugh<sub>2</sub>tér-*, also *\*ph<sub>2</sub>tér-* ‘father’, *\*máh<sub>2</sub>ter-* ‘mother’, *\*b<sup>h</sup>ráh<sub>2</sub>-ter-* ‘brother’ and *\*h<sub>1</sub>iénh<sub>2</sub>ter-* ‘sister-in-law, husband’s brother’s wife’. Of these only the word for ‘daughter’ is attested in Anatolian, and only the words for ‘father’ and ‘daughter’ conform to the regular pattern of accent and ablaut according to which a full-grade suffix such as *\*-ter-* should be stressed in the strong forms (nominative, vocative and accusative) as opposed to a zero-grade *\*-tr-* in the weak cases. This in turn means that we only arrive at a transparent derivational picture if ‘father’ and ‘daughter’ are considered original formations, while ‘mother’, ‘brother’ and ‘sister-in-law’ are to some degree modelled after this nucleus, presumably ‘mother’ and ‘brother’ after ‘father’, and ‘sister-in-law’ after ‘daughter’.

Now, a suffix *\*-h<sub>2</sub>ter-* is not otherwise known, but if the roots contained in the terms for ‘father’ and ‘daughter’ accidentally ended in *\*-h<sub>2</sub>-* we would be dealing with regular agent nouns in *\*-tér-*. As for the ‘father’ word, the analysis is fairly simple: as is often assumed, this would originally be a ‘protector’ from *\*pah<sub>2</sub>-* ‘protect’, cf. e.g. Vedic *pāti* ‘protects’, *go-pá-* ‘cowherd’. But if this analysis is correct, which root is then the derivational basis of the word for ‘daughter’, or in other words, what did a daughter do? In view of the archaic word formation, it seems worthwhile to probe a little further into this matter despite widespread opposition against etymologizing primary kinship terms. Thus, Huld (Mallory & Adams 1997: 148) concludes: “Persistent efforts to

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stream like milk’, i.e. ‘fulfilling (the object of) desires’, Sanskrit fem. subst. *kāma-duh(ā)* ‘the cow of plenty’ (cf. GEW II: 941).

<sup>15</sup> IEW 277; Mallory & Adams 1997: 147–148; NIL 126–130; Olsen 2019: 146–148 and 2020: 60–62.

create just-so stories about Indo-European home-life by etymologizing ‘daughter’ as ‘milker’ (< \**d<sup>b</sup>eug<sup>b</sup>-*, though the meaning ‘milk’ for this verb is restricted to Indo-Iranian) more recently as the person who prepares the meals ... provide no insight into the actual state of affairs”.

Some earlier attempts are indeed abortive, as Szemerényi’s suggestion (1977: 19ff) of a derivation from \**d<sup>b</sup>eug-*, as in Goth. *gadauka-* ‘housemate’, which must be rejected for formal reasons. However, an etymological connection with Vedic *dubé* etc. would still be an option.<sup>16</sup> The root would then have to be reconstructed as \**d<sup>b</sup>eugh<sub>2</sub>-* rather than \**d<sup>b</sup>eug<sup>b</sup>-*, which is perfectly possible, allowances made for analogical generalization of the prevocalic alternant \**dhaugh-* in Indo-Iranian verbal forms leading to analogical elimination of the laryngeal-based vowel *-i-* in Vedic (e.g. regular *dubé* vs. analogical *duhré* for \**dubiré*). With all due reserve, one may then suggest a revival of the old hypothesis that a daughter, a \**d<sup>b</sup>ugh<sub>2</sub>-tér-*, was indeed a ‘milker’, someone ‘extracting’ or ‘making stream’ the life-giving milk, presumably with the secondary derivative \**d<sup>b</sup>ugh<sub>2</sub>tló-* > Old Irish *dúal* (\*‘freely streaming (like mother’s milk)’ →) ‘native, natural’. In a pastoral society, potentially comparable with e.g. the Maasai where the women milk the cattle while the men are herders and warriors, a line of thought of this kind would hardly seem inappropriate.

#### 4. Milk

As the verb ‘to milk’ is extremely well attested, one would have expected a corresponding noun to be equally widespread. However, this is not so. A root noun \**meluk-* > Gothic *miluks*, Old Norse *mjǫlk*, Old English *meoloc*, Old High German *miluh*, as if from \**h<sub>2</sub>melǵ-*, is restricted to Germanic<sup>17</sup> and may well be a secondary deverbal formation.<sup>18</sup> Similarly, though the Tocharian word, B *malkwer*, A *malke* ‘milk’ (Adams 2013: 475) follows an archaic derivational pattern, it has no immediate parallels in other languages. Thus, even though the knowledge of milking cannot be doubted, the oldest designation for the substance was generally lost and later substituted by other terms in the individual branches.

<sup>16</sup> Pârvulescu (1993), accepting the root \**d<sup>b</sup>eug<sup>b</sup>-*, assumed a semantic development from ‘worker’ to ‘girl, daughter’.

<sup>17</sup> Probably borrowed into Slavic as Old Church Slavic *mlěko* etc.

<sup>18</sup> Cf. also Kümmel 2004, Kroonen 2013: 364 and Hansen 2017.

#### 4.1. The word family of Greek γάλα

The closest we come to a common word for ‘milk’ is represented by Greek γάλα(κτ)-, Latin *lac*, *lactis* ‘milk’ and Albanian *dhallë* ‘butter-milk’ (Demiraj 1997: 153; Orel 1998: 80). However, the root structure is somewhat peculiar, so that one might suspect a non-Indo-European origin, and if the European words are related to Hittite *galaktar-* ‘a soothing substance’ with the verb *gala(n)k-* ‘soothe, appease’ (Rieken 1999: 379) the meaning ‘milk’ would not have been coined until after the first split of Anatolian.

#### 4.2. \*peǵH-

As substitutions of an extinct word for ‘milk’, Indo-Iranian and Baltic agree on derivatives of the root \*peǵH- ‘swell, overflow, be fat’ (LIV 464). Thus Vedic *páyas-*, Avestan *paīiah-* ‘milk’ (EWAia II: 83) point to an *s*-stem \*peǵHe/os- ‘milk’ and Avestan *paēman-* ‘mother’s milk’ < \*peǵHmen- goes back to the \*-men-stem that constitutes the derivational basis of Lithuanian *píenas* (Fraenkel 1962: 585) < \*peǵHno- < \*peǵHmno- ‘milk’. The most remarkable correspondence is that between the fem. pf. participles Vedic *pipyúṣī-* ‘swelling (with milk)’, Avestan *a-pipīiūšī-* ‘not suckling’ (Vd.15.8), and Lithuanian *papījusi kárvė* ‘milching cow, cow that does not hold its milk back’.

Another potentially relevant derivative traditionally connected with this root may be Old English *fǣmne* ‘virgin, (young) woman’ < \*faimnia- for which one may suggest an origin as the corresponding middle participle with analogical *o*-grade – transposit \*(pe)poǵH-mh<sub>2</sub>/no/ah<sub>2</sub>- – with secondary suffix \*-iah<sub>2</sub>- and a meaning ‘a swelling, exuberant female’. As an interesting match, Vedic has the regular zero-grade formation \*pi-piH-ṛh<sub>1</sub>/náh<sub>2</sub>- → *pipyānā-* in a similar context: RV 3.33.10: *pīpyānéva yóṣā* ‘like a young woman swollen (with milk, to her infant)’.<sup>19</sup> Within the semantic field of dairy terminology one may perhaps also point to Swedish *filmjolk*, Danish *filmælk* ‘soured milk’ if *fil-* is derived from \*piHtlo- rather than seen as an obscure variant of Old Norse *þél* < \*temktlo- with the same meaning (cf. Hellquist 1980, I: 209).

Actual verbal forms are only attested in Indo-Iranian and Baltic, where the basic meaning seems to be ‘swell, overflow (with milk)’.

<sup>19</sup> Cf. also RV 3.1.10: *éko adhayat pīpyānāh* ‘alone, he suckled upon the many swelling females’ and 10.102.11: *pīpyānā ... siñcán* ‘she swelling, he dripping’.

Cf. the perfect forms, Vedic *pīpāya* ‘is swollen’ with the above-mentioned participles, the nasal present of Vedic *pīnvati* ‘makes swell’, Avestan *fra-pinaoiti* ‘makes thrive’, and the  $\dot{i}$ -present of Lithuanian *pyjū* (*pýti*) ‘yield plenty of milk’ (about cows) and ‘become soft and humid’ (about the ground). No more far-reaching analysis of the root is needed, and Lubotsky’s bold analysis (2011: 121), followed by Derksen (2015: 359), is unlikely: “Since the root actually means ‘to yield milk’, it can hardly be separated from \**peh<sub>3</sub>*- ‘to drink’”.

According to Lubotsky, we are dealing with an enlarged root, arising from an alleged  $\dot{i}$ -perfect, but one may raise formal objections to this interpretation. As demonstrated by Rasmussen (1989: 56 and 265–267), the root meaning ‘drink’ has a long-diphthong structure, \**peh<sub>3</sub>i-*. The semantic aspect proposed by Lubotsky is equally objectionable. Even though he goes so far as to equal Lithuanian *pýti* with Old Church Slavic *piti* ‘drink’, of which the latter definitely belongs to the root \**peh<sub>3</sub>i-*, the difference in meaning is far from negligible. First, ‘to yield milk’, even if this is interpreted as ‘to make drink, give to drink’, is certainly not the same as ‘to drink’. Secondly, there is no evident connection between ‘milk’ and ‘drink’ in so far as the habitual drinking of milk after infancy is a relatively late phenomenon, restricted to populations with a sufficiently developed lactose tolerance. For the suckling of infants, we have ample evidence that the Indo-Europeans used a different root, \**d<sup>h</sup>eh<sub>1</sub>i-* (LIV 138).

On the other hand, the double reference of *pýti* to cows and soil, as found in Lithuanian, fits perfectly with the semantic scope of \**pejH-*. Thus, the Greek adjective  $\pi\acute{\iota}\omega\nu$  < \**piHuōn*, fem.  $\pi\acute{\iota}\epsilon\iota\pi\alpha$  < \**píHuērih<sub>2</sub>* ‘fat, fertile’ (= Vedic *pīvan-*, fem. *pīvarī-*) is used as an epithet of  $\acute{\alpha}\rho\omicron\upsilon\pi\alpha$  ‘ploughland, soil’ (Il.18.541; Od. 2.328 and 23.31),  $\acute{\alpha}\rho\omicron\varsigma$  ‘field’ (Il.23.832; Od.4.757 and 8.560) and  $\delta\eta\mu\omicron\varsigma$  ‘land’ (Il.5.710, 16.437, 514, 673, 683 and 20.385; Od.17.526 and 19.271). The same background is further suspected for the substantivized Old Irish *īriu* < \**pīuēriō*, gen. *īrenn* ‘land, earth, soil’, supplied with the individualizing *n*-stem suffix and identical with the old Welsh name for Ireland, *Iwerddon* with an assumed implicit feminine noun.<sup>20</sup> The idea of ‘fatness of the land’ in words based on the same root is also apparent in e.g. Middle Irish *íath* ‘land, country’ < \**pejHtu-* beside the zero-grade

<sup>20</sup> Cf. Stüber (1998: 95–97) for details, also on Old Irish *Ériu* ‘Ireland’ with a problematic initial *é*-.

forms *ith* < \**pītu-* ‘fat, lard, grease’ and *ith* < \**pit<sup>(h)</sup>u-* ‘corn, grain’ (de Bernardo Stempel 1999: 292).<sup>21</sup>

The twofold reference of derivatives of the root \**peiH-* to the swelling of breasts or udders with milk on the one hand and fertile or humid land on the other is quite striking, but perhaps not too surprising to an Indo-European frame of mind. At least the connection must go back to Core Indo-European, here defined as the stage immediately following “Indo-Tocharian”. What is more, it fits perfectly into the well-attested equation made between the Cow and the Earth, as described in Olsen 2020, and perhaps even more remarkable, the idea of the earth having an udder, as in Latin *ūbera campi* ‘the udders of the fields’, Greek οἰθαρ ἀρούρης ‘the udder of the ploughland’.<sup>22</sup>

## 5. Other dairy products

As opposed to words for milk, the terminology for processed dairy products such as curds, buttermilk, cheese and whey is surprisingly rich.

### 5.1. \**temk-*

A root for which a specialized meaning pertaining to dairy must be attributed to at least Core Indo-European, is \**temk-* (LIV 625). The precise reconstruction depends on Anatolian, since only Hittite *tame(n)k-* (trans.) ‘affix, attach’/(mid. and intrans) ‘stick to’, metaphorically ‘join, have an affection for’ (Tischler 1991: 77–79; Kloekhorst 2008: 824–825) points to \**-m-* rather than \**-n-* as the original nasal. In the other languages, the meaning seems to be ‘get thick, solid; curdle’, so this seems to be one of the cases where Anatolian, as the first member to leave the Proto-Indo-European community, preserved a more original meaning. While a semantic development from ‘be sticky, gluey’ to ‘curdle’ whence ‘get solid, tight’ seems fairly straightforward, a transition from ‘get/be sticky’ to ‘get/be solid’ is less evident. Thus one may

<sup>21</sup> Of these \**pī<sup>h</sup>u-* would be the regular development of \**pih<sub>1/2</sub>tu-* with laryngeal metathesis \**-h<sub>1/2</sub>t-* > \**-th<sub>1/2</sub>-* and otherwise unexplained short vowel according to the principle stipulated in Olsen 1994 and later works, while \**pītu-* would reflect an analogical preservation of the zero-grade form \**piH-* > \**pī-*. The *tu-* stem is also continued in Indo-Iranian, cf. Vedic *pitū-*, Avestan *pitu-* (short *i*-vowel) ‘solid nourishment’ and Armenian *hiwt<sup>c</sup>* ‘moisture; thickness; matter’ where the vowel quantity cannot be determined (cf. Klingenschmitt 1982: 180).

<sup>22</sup> I intend to address this question in more detail on a later occasion.

perhaps venture the assumption that the meaning ‘curdle’ developed as a common Core Indo-European dairy term.

The root is known from several derivatives, including verbal forms such as Vedic (YV) *ā-tanakti* ‘cause coagulation by casting one liquid into another’ with the noun *ā-tañcana-* (n) ‘that which causes coagulation (as buttermilk which is thrown into fresh milk to turn it), rennet’, Old Irish *co-téim* ‘congeal, curdle (of milk)’ (cf. McCone 1998: 469–470) and with a more general meaning Gothic *þeihan*, German *gedeihen* etc. ‘thrive, prosper’.

A particularly striking correspondence is found between Indo-Iranian and Germanic, where Sanskrit *takra-* (n) denotes ‘buttermilk mixed with (a third part of) water’,<sup>23</sup> while Modern Icelandic *þél* (n; 18th century) is explained by Magnússon (1989: 1175) as ‘skyrþetti, kögglar í skyr’, i.e. ‘skyr mixed with milk with the addition of rennet; lumps in skyr’ – *skyr* is made by letting the whey run from sour milk. The background of *takra-* would be *\*tmk-tlo-*, that of *þél* *\*temk-tlo-* with an ablaut difference that may reflect an original neuter/collective *\*tmk-tló-* : *\*émk-tlah<sub>2</sub>-*, and the function must be that of an action noun ‘curdling’.<sup>24</sup>

From a full-grade *to*-derivative *\*temkto-* an exact correspondence exists between Middle Irish *técht* ‘thick, sluggish, viscid; curdled (of milk)’<sup>25</sup> and ON *þétrr* ‘solid’. Here the semantic connection becomes even clearer when the modern Nordic languages are included. Thus, beside the Swedish adjective *tät* ‘thick’, we also find *tätmjölk*, dial. subst. *tätt* (m) ‘curdled milk’, and *tätte*, *tete* (m), Norwegian *tette* (n) ‘rennet’, cf. Hellquist (1980: 1267), who hypothesizes that *tätmjölk* was probably what Tacitus was referring to (Germania 23.1) when he allegedly talked about the Germanic peoples’ preference for ‘lac compactum’ – in reality ‘*lac concretum*’:

*cibi simplices, agrestia poma, recens fera aut lac concretum: sine apparatu, sine blandimentis expellunt famem*

<sup>23</sup> Cf. also *takrāta-* m. ‘churning-stick’.

<sup>24</sup> The *\*-t-* would be regularly deleted in interconsonantal position, i.e. *\*temk-tlo/ah<sub>2</sub>-* > *\*temklo/ah<sub>2</sub>-*, which means that *takra-* for expected *\*taktra-* would be analogical after the full-grade form. Still, this reconstruction seems preferable to the traditional *\*temklo-/tmklo-* as derivatives in *\*-lo-* would not normally have ablaut in the root (cf. Olsen in preparation). A derivation from *\*tek<sup>w</sup>-* with connections to the word for ‘whey’, offered as an alternative suggestion by Kroonen (2013: 542), seems less attractive for semantic reasons, the whey being the fluid rather than the curdled component.

<sup>25</sup> Vb. *téchtaid* ‘freezes, congeals, coagulates’, trans. ‘freezes, solidifies, curdles’.

‘Their diet is simple: wild fruit, fresh game, curdled milk. They banish hunger without great preparation or appetizing sauces’.

Morphologically *\*temkto-* may be a partially adjectivized substantive which would explain the full grade of the root.

## 5.2. *\*d<sup>h</sup>eh<sub>1</sub>-*

Another relatively old formation within the same word field is dialectally restricted to Albanian, Indo-Iranian and Baltic: Vedic *dādhi*, gen. *dadhnáh* ‘sour, coagulated milk’ (EWAia I: 692–693), Albanian *djathë* ‘cheese’ (Demiraj 1997:195–196, Orel 1998: 67), Old Prussian (*ructan*) *dadān* ‘(sour) milk’. There seems to be almost general agreement that the basic root is *\*d<sup>h</sup>eh<sub>1</sub>-* ‘suck, suckle’ (LIV 138–139; also in several nominal derivatives), thus, apart from the above-mentioned works, e.g. Pokorny (IEW 241–242) and Mallory & Adams (1997: 382). However, the meaning of this root is clearly ‘breastfeed’ (about the mother), respectively ‘suck mother’s milk’ (about the baby/young), whereas ‘curd’ or ‘sour milk’, not to mention ‘cheese’, are the results of secondary production. I therefore consider it more likely that we are dealing with derivatives of *\*d<sup>h</sup>eh<sub>1</sub>-* ‘stellen, legen, setzen; herstellen, machen’ (LIV 136–138; NIL 99–117).

For the process of making curd or cheese, the English expression is *setting of milk*, in German the term for curd is *Setzmilch*, and in Danish the same produce is called *oplagt mælk*, calqued on older German. Thus, Uno von Troil, in his chapter *Von den Speisen der Isländer*, offers the following description of *aufgelegte Milch* (1785: 74): “Skyr (aufgelegte Milch), die saure Milch, woraus die Molken gepreßt sind, wird in Tonnen und Gefäßen verwahrt”.

In the Rigveda, neuter nom.acc.sg. *dādhi* ‘sour, coagulated milk’ is matched by the gen.sg. *dadhnáh* (2×) and the inst.sg. *dadhná* (2×). Though the existence of *i/n*-heteroclitics is rather extraordinary, Mayrhofer (l.c.) feels justified to conclude: “Der Erbcharakter der Heteroklisie *dādhi/dadhn*° ist wohl nicht zu bezweifeln”. A more hesitant judgement is expressed in the *Altindische Grammatik* (Wackernagel 1975: 306) where, exceptionally, the appurtenance to the root for ‘suck(le)’ is not taken for granted: “In *dādhi* war das *i* wurzelhaft, wenn es wirklich zur Wurzel *\*dhēi-* ‘saugen’” gehört ... dann wäre *dādhi* erst nachträglich in die *i/n*-Flexion geraten; aber das *n* scheint hier schon ig. zu sein ...”.

As a reduplicated formation, *dādhi*, if from *\*d<sup>h</sup>e-d<sup>h</sup>i-*, would be structurally similar to archaic deverbally derived adjectives, frequently with

an intensive meaning (Wackernagel 1954: 291). Cf. examples (all Rigveda) such as *dadí-* ‘giving’, *papí-* ‘drinking’, *yayí-* ‘going’, and even from *\*d<sup>b</sup>eh<sub>1</sub>-*, *dádhi-* ‘establishing’ in RV 10.46.1: *dádhir yó dháyi sá te váyāmsi yantí vásūmi vidhaté tanūpāḥ*: ‘he who has been established establishes vital power for you; he is the extender of goods to the man who does honor and he is the protector of bodies’. The accent in these adjectives usually falls on the *-i-* when the first syllable is short, otherwise on the root, thus e.g. *cákri-* ‘working’ (= Old Avestan *caxri-* ‘making’) and *jághni-* ‘slaying’. Incidentally this may suggest that the cluster *\*d<sup>b</sup>h<sub>1</sub>-* in *dádhi* counted as two consonants longer than *\*dh<sub>3</sub>-* in *dadí-* where the presumably voiced *\*h<sub>3</sub>* would have assimilated to the preceding consonant at an earlier stage.

A category of proper heteroclitics with nom.acc. *-i* in Vedic is weakly founded, and as for the background of *ásthi-* ‘bone’, it is debatable whether the final *-i* goes back to a laryngeal or an *i*-vowel. At least the cognate Hittite *ḫastai-* and Greek ὀστέον would point to an ablauting suffix, and with the other “*i/n*-heteroclitics”, *ákṣi-* ‘eye’ and *sákthi-* ‘thigh’, the dual form may have played a role. Thus, *dádhi* remains isolated, and at least, as stressed by Beekes (1987: 50), *i/n*-stems cannot be established as an Indo-European stem type. Consequently, it seems preferable to consider *dádhi* : *dadh<sub>n</sub>-áh* a secondary constellation of two originally independent forms of which *dádhi* is presumably a lexicalized substantivization of the agent noun ‘setting’.

The creation of the suppletive oblique stem is less clear. Possibly the reduplicated ‘pseudo-root’ *\*d<sup>b</sup>ed<sup>b</sup>h<sub>1</sub>-* formed a *\*-men*-stem *\*d<sup>b</sup>éd<sup>b</sup>h<sub>1</sub>-m<sub>ṅ</sub>* > *\*dadhman-*.<sup>26</sup> At least a stem in (*\*-mno-* >) *\*-mo-* is substantiated by Greek θεσμός, Doric τεθμός, θεθμός ‘that which is laid down, established’, i.e. ‘law, ordinance’, Middle Welsh *dedyf*, Modern Welsh *deddf* ‘law’ < *\*d<sup>b</sup>e-d<sup>b</sup>h<sub>1</sub>-mo-* (cf. Thurneysen 1923: 57).<sup>27</sup> However, by a process of dissimilation, we expect the suffix variant *\*-mo-*, as indeed in *\*d<sup>b</sup>e-d<sup>b</sup>h<sub>1</sub>-mo-*, after neutral roots as opposed to *\*-no-* after roots containing a labial, thus e.g. *\*g<sup>wh</sup>orno-* > Latin *furnus* ‘oven’ (cf. Rasmussen 1989: 187–198). The same distribution is originally valid for the end-stressed weak cases of Vedic *-man*-stems, as already observed by Schmidt (1895: 121–122), thus inst.sg. *drāghmá* from *drāghimán* ‘length’ and *raśmá* from (*a*)-*raśman-* ‘(without) reins’ vs. *prathiná* from

<sup>26</sup> With laryngeal loss after the reduplication syllable as is also found in reduplicated verbal formations such as 1.pl. *dadh<sub>m</sub>ási*, *dadmasi* from *\*d<sup>b</sup>eh<sub>1</sub>-* ‘put’ and *\*deh<sub>3</sub>-* ‘give’ respectively.

<sup>27</sup> Cf. also the Old Irish hapax gen.sg. *deidmea* ‘law’ (LÉIA D-41).

*prathimán-* ‘width’, *preṇá* from *premán-* ‘love’, *bhūná* from *bhūmán-* ‘riches’/*bhūman* ‘earth’, *mahiná* from *mahimán-* ‘greatness’ and *variṇá* from *varimán-* ‘breadth’. Thus the expected instrumental of a hypothesized \**dadhman* ‘setting’ or ‘something set’, lexicalized as ‘coagulated milk’, would be \**dadhma* with corresponding genitive \**dadhmah*.

A slight adjustment to the attested *dadhna*, *dadhnaḥ* is perhaps best explained as influence from one of the other members of this extremely rare type of heteroclitics, viz. *ákṣi* ‘eye’ with the suppletive *n*-stem, gen. *akṣnáḥ*, inst.pl. *akṣábbhiḥ* (for which, cf. EWAia I: 42–43 with references).

As for the suggested interpretation of the nom.acc. *dádhi* as a reduplicated deverbal adjective, this would correlate with the likewise reduplicated Old Prussian *dadān* apart from the discrepancy between the Vedic *i*-stem and the thematic stem in Baltic. Here we would have the type matching intensive nominal stems in Vedic, e.g. *dadhṛṣá-* ‘bold’ and in particular the inherited \**k<sup>w</sup>e-k<sup>w</sup>lh<sub>1</sub>ó-* > *k<sup>w</sup>ek<sup>w</sup>ló-* ‘wheel’ > Ved. *cakrá-* etc. (Wackernagel 1954: 85). Thus *dadān* would continue a neuter \**d<sup>h</sup>e-d<sup>h</sup>h<sub>1</sub>óm*, probably with distant assimilation *-e-a-* > *-a-a-* (cf. also Mažiulis 1988: 171–172).

### 5.3. \**kerH-*

In his etymological dictionary, Martirosyan (2010: 574–575) noticed a remarkable correspondence between Armenian *ser* ‘cream of milk, skin on milk or sour, clotted cream’ (unknown stem class) and Vedic *śáras-* (n) ‘skin on milk’ (EWAia II: 617–618), both pointing to a regular *e*-grade *s*-stem \**ker(H)os* beside Sanskrit *śara* < \**kor(H)o-* ‘sour cream’. Cf. also the continuations in Modern Indic, e.g. Kashmiri *har* ‘cream, skin, scum on curdled mil or oil’, Bengali *sar*, Oriya *sara* ‘cream, thick milk’, Hindi *sar* ‘cream, curds’ (Turner 1962: 714).

According to Mayrhofer (l.c.) the basic root is *śari-* < \**kerh<sub>2</sub>-* ‘break’ (cf. also Lidén 1934: 5–6), but for semantic reasons a better option may be \*(s)*kerH-* ‘trennen, teilen’ (LIV 558) which is, after all, what sour cream or milk does. In that case, the root with addition of a mobile \**s-* would be identical with that of Icelandic *skyr* < \**skurja-*, Danish *skørmælk* ‘sour milk’ (Magnússon 1989: 880) and the corresponding verb Old Norse *skerask* ‘separate’ (of milk). Quite similarly, Lithuanian *at-skirti* ‘separate’ from the same root is used in connection with *pienas* ‘milk’.

5.4. \**ser(H)*-

Also the root \**ser(H)*- ‘flow, stream’ (IEW 909–910) seems to have been the basis of words in the context of cheese production at least at the pre-stage including Italic and Greek. Thus Latin *serum* ‘whey, serum’ is connected with Greek ὀρός ‘whey, the watery part of curdled milk’, potentially a substantivization of the adjective underlying Sanskrit *sarā*- ‘liquid, fluid’ < \**sor(H)*ó-, though the root \**sel*- ‘sich losschnellen, springen’ (LIV 527), cannot be definitely excluded for the Indic form.<sup>28</sup> The morphological background of *serum* would be a full-grade neuter \**sér(H)om* of the type \**uérġom* ‘work’.

5.5. \*(*h*<sub>1</sub>)*reug*-

For the production of cream and butter, derivatives from a root \*(*H*)*reug*- are attested with cognates in Germanic, Iranian and Baltic, of which Kroonen (2011: 186–187) has treated the Germanic evidence in detail. Here an *e*-grade formation is posited for Icelandic *rjómi*, Norwegian *rømme*, Swedish *römme* ‘cream’ and Old English *réama*, *réoma* ‘membrane, meninx’ (cream settling as the skin or top layer of milk), while Old English *réam*, Middle High German *roum*, German *Rahm* ‘cream’ point to an *o*-grade. As an original paradigm, Kroonen tentatively suggests an ablauting *-men*-stem “*Hréu(H)g<sup>wb</sup>-mōn*, gsg. \**Hru(H)g<sup>wb</sup>-mn-ós*, apl. \**Hrou(H)g<sup>wb</sup>-mn-ús*”. However, a *men*-stem would not usually exhibit *o*-grade in the root, and actually only the *e*-grade forms point unambiguously to an *n*-stem, while Old English *réam* etc. may just as well reflect an *a*-stem \**rauma*-. It therefore seems preferable to operate with a *men*-stem \*(*H*)*reug<sup>(h)</sup>mn̥* with a secondary *o*-grade derivative \*(*H*)*roug<sup>(h)</sup>mno*- → \*(*H*)*roug<sup>(h)</sup>mo*-. Strictly speaking, one would expect the suffix variant \**-no*- rather than \**-mo*- after a root containing a labial, cf. \**leuksmn̥* → \**louksnah<sub>2</sub>*- > Latin *lūna*, Russian *luna* ‘moon’, but \**-mo*- is productive in such formations, and moreover the more archaic form is preserved in Avestan as *raoyna*- ‘butter’. What looks like a substantivized *to*-participle is found in Old Prussian *ructan dadan* (‘sour curds’, i.e.) ‘sour milk’.

<sup>28</sup> The background of Albanian *gjizë* ‘goat cheese, cottage cheese’ is unclear, cf. Demiraj 1997: 189–190 and Orel 1998: 136 for suggestions and discussion. For Tocharian B *šarwiye* not even the meaning is clear, ‘cheese’ or ‘fleece’, cf. Ching 2010: 399–400 (thank you to Simon Poulsen for the reference) and Adams 2013: 713.

The further etymological background still has to be defined, and as has already been suggested, a series of supplementary cognates may be found in Lithuanian *ráugas* ‘sourdough’, *ráugėti* ‘turn sour (about milk)’ (cf. Fraenkel II: 705; Derksen 2015: 377–378). Semantically this connection makes good sense as sour cream is traditionally used for butter production. From a formal point of view, we may then define the root as containing a \*-g- rather than \*-g<sup>b</sup>- on account of Winter’s Law.<sup>29</sup> This brings us to the underlying root, \*(h<sub>1</sub>)reug- ‘belch’ (LIV 509), which is the basis of a verb continued in Italic, Germanic, Greek, Armenian and Balto-Slavic: Latin *ērugō* ‘belch’ (cf. also *rūmen* ‘first stomach of a ruminant’ with denominative *rūminō* ‘chew, ruminate’), Old High German *ita-rucken* ‘ruminate’, Greek ἐρεύγομαι ‘belch out’, Armenian *orcam* ‘belch; vomit’, perhaps from a denominative \*pro-(h<sub>1</sub>)rug-ah<sub>2</sub>-īe-, and Lithuanian *ráugėti* ‘belch’ beside ‘turn sour’. The exact shape of the root remains uncertain, \*h<sub>1</sub>reug- or \*reug-, as both \*h<sub>1</sub>- and an initial \*r- in Greek would trigger a prothetic vowel ê.<sup>30</sup>

The question of how to combine ‘belching’, ‘vomiting’ or ‘chewing the cud’ semantically with (sour) cream or butter is usually passed over in silence in the literature, but the most obvious solution would be to think of babies with reflux, burping and spitting out curdled, sour milk.

### 5.6. \*t<sub>1</sub>uerh<sub>2</sub>-

A Greco-Iranian set of cognates includes Greek τυρός (m) ‘cheese’ with the compound βούτυρον/-ος ‘butter’ and Avestan *tūiri-* ‘cheeselike milk, whey’ with the derivative *tūiria-* ‘curdle (of milk)’,<sup>31</sup> of which the etymological background has not been definitely established. According to the IEW (1083), we are dealing with a \*-ro-derivative of the root \*teuh<sub>2</sub>- ‘swell’. However, this is formally problematic, since \*-uh<sub>2</sub>- in unaccented syllables is expected to yield \*-wā-, not \*-ū- in Greek (cf. Olsen 2009), and besides, the semantic connection is not obvious. Mallory and Adams (1997: 382–383) hesitantly state that the stem “looks to be a nominal derivative of an underlying verb \*t<sub>1</sub>ueh<sub>x</sub>- which, however, is otherwise unknown”. Beekes (2010: 1520) tended to

<sup>29</sup> For the loss of the root-final stop in Germanic \*reuman-, \*rauma-, cf. Hirt (1931: 1927): “Guttural ist nach Diphthong oder langem Vokal vor m geschwunden”, other examples being Old Norse *taumr* ‘rein’ from \*deuk- and *draumr* ‘dream’ from \*d<sup>h</sup>reug<sup>h</sup>-.

<sup>30</sup> The irregular initial o- of *orcam* is perhaps best explained as a preverb, cf. e.g. Greek προο-ερεύγομαι ‘belch at’ (Olsen 1999: 764).

<sup>31</sup> Perhaps also apabhramśa *tūra-* ‘cheese’ (KEWA I: 516).

accept the old connection with \**teuh<sub>2</sub>*- ‘be strong, swell’ as “phonologically unproblematic, and semantically possible”, while rejecting alternative suggestions for formal reasons: “Phonologically, τῦρός can be derived neither from PIE *t<sub>2</sub>uer*- ‘to stir’ ... nor from PIE *t<sub>2</sub>uerH*- ‘to hold, fence in’”.

Of these roots, the only reason for bringing \**t<sub>2</sub>uerH*- ‘fassen’ (LIV 656) into the discussion would be a tentative analysis of Slavic \**tvarog* ‘curds’ > Russian *tvoróg* as something ‘formed’ or ‘made’ from the verb *tvoriti* with a semantic development similar to French *fromage* and Italian *formaggio* from Latin *formāre*. Vaillant (1974: 496) assumed that an explanation along these lines could at best be the result of popular etymology because the final element remained unexplained.<sup>32</sup>

From \**t<sub>2</sub>uer*- ‘aufrühren, erregen, antreiben’ (LIV 655), the verbal derivatives are assumed to include Greek ὀτρύνω ‘encourage, urge, incite, stir up’, Vedic *tvárate* ‘hurry’, and from Germanic, Old English *þweran* ‘twirl, stir’ and Old High German *dweran* ‘stir up’. These in turn are further connected to the instrument noun \**þwerila*- > Old English *þwirel* ‘(handle of a) churn’, Old Norse *þyrill*, Old High German *thwiril* ‘beater, whisk’ and in particular Old English *ge-þweor* ‘curds’ which, as noted by Kroonen (2013: 555), is semantically reminiscent of the above-mentioned Slavic \**tvarog*. Indeed, the unanimous semantic specialization of the Germanic and Slavic derivatives makes it tempting to see an old connection between the two branches in this lexeme. If the formal details turn out to be compatible, this idea may be further corroborated by Latin *trua* ‘stirring spoon’ and Greek τρυφή ‘stirrer, ladle for stirring things while boiling’.

The best way to unite this semantically closely-knit group of derivatives must be by way of an assumption that the basic root was \**t<sub>2</sub>uerH*- with a final laryngeal.<sup>33</sup> While the full grade \**t<sub>2</sub>uerH*- would in principle remain intact, the zero grade \**t<sub>2</sub>urH*- would undergo metathesis to

<sup>32</sup> Cf. also Sorbian *tvarog*, borrowed into Middle High German as *twarc*, *quarc*, *zwarg*, German *Quark* (Kluge 1995: 659).

<sup>33</sup> Kümmel’s motivation for positing an *aniṭ* root (LIV 655) is the lack of consonant gemination in Germanic, but this is hardly decisive. A separation of \**-r-* and \**-H-* may have been transferred from either a *i*-present (cf. Old Norse *þyrja* ‘rush’), or from a nasal present as indirectly continued in Greek ὀτρύνω. Sanskrit *tvára-* as such is ambiguous in this respect, but if the participle *-tūrta-* belongs to this root as \**-t<sub>2</sub>urHtó-* it may have an exact match in Young Avestan *θβāšā-* ‘fast, quick’ apart from the accent retraction to \**t<sub>2</sub>urH-to-*, cf. the thorough discussion in Gotō (1987: 169–70).

\**truH-*,<sup>34</sup> which would explain the Latin form as a zero-grade *a*-stem. The Greek nasal present ὀτρύνω with preverb ὀ- is not quite clear. However, the most likely solution may involve a protoform \**-tūr-n-H-* > \**-trun-* with restitution of the zero grade to \**-trūn-*, as if \**-tūrH-* + nasal suffix *-n-*, rather than the thematicized \**-neu-/nu-* present \**tūr-n-μ-* > \**tru-nμ-* reconstructed in LIV l.c. or the combination of nasal present and *i*-present suggested by Frisk (GEW II: 441).

As for the noun τούρη, we are probably dealing with a contamination between *o*-grade \**tūr(H)-nah<sub>2</sub>-* – the type of Greek πόρνη ‘prostitute’, στόρη ‘belt’ – and zero grade \**tūrH-nah<sub>2</sub>-* > \**trūnā-*, which would be secondary derivatives of a \**-men*-stem \**tūrHm̄n̄*. Here, as we have already seen, the dissimilatory selection of the suffix variant \**-no/ah<sub>2</sub>-* rather than \**-mo/ah<sub>2</sub>-* would be regular after roots containing a labial. A similar type of contamination between full grade and zero grade is seen with the root \**uelHu-* ‘roll’ in the \**-men*-stem (\**uelHu-* : \**uluH-* > \**uluH-*) → \**ueluH-m̄n̄* > Latin *volūmen*, Greek εἴλυμα, Armenian *gelumn*.

Still, Greek τῦρός, βούτυρον/-ος, Avestan *tūiri-*, *tūiria-* and Slavic \**tvarogō* have not been adequately explained. As the lack of breaking in Greek would only be compatible with an \**-h<sub>1</sub>-*, an automatic transposition of the stems would be \**tub<sub>1</sub>ró-* and \**tūob<sub>1</sub>ro-* respectively, not accounting for the Slavic end segment. Certainly, these forms are not immediately compatible with the zero grade and *o*-grade of a root \**tūr<sub>h</sub>h<sub>1</sub>-*, so we cannot be certain if we have to accept an entirely different, and unfortunately so far obscure, etymological background or there may be a more or less convincing way out to combine the whole group.

At any rate, the ablaut difference suggests that we are dealing with derivatives of an older alternating pattern, be it a root noun or a heteroclitic, of which the latter may be the most likely option as it could potentially favour a dissimilatory loss of the first \**-r-*. Thus, from the weak form of a paradigm \**tūr<sub>h</sub>h<sub>1</sub>-r̄/\*tūr<sub>h</sub>h<sub>1</sub>-n-ós* → \**tūr<sub>h</sub>h<sub>1</sub>-r-ós* ‘stirring’ or the like, one might get a thematicized \**trub<sub>1</sub>r-ó-* → \**tub<sub>1</sub>ró-* by dissimilation, whence the Greek form ‘something stirred’ and Avestan *tūiri-* with *i*-stem substantivization.

For the predecessor of the Slavic form there are various possibilities. It might have been thematicized from the strong forms of the paradigm

<sup>34</sup> Cf. Rasmussen 1989: 75ff on the morphophonemic alternation of \**-eRHu-/ \*-RHu-* structures.

suggested above, i.e. \**tuoh<sub>1</sub>ro-*, also with dissimilation, or it might go back to a long *o*-grade, \**tuōrh<sub>1</sub>o-* as a *vṛddhi* derivative. Still, we have not accounted for the puzzling final *-ogz̥*, for which only tentative hypotheses are at hand – perhaps originally a derivative in \**-okz̥* with a similar variation of \**-k-* and *-g-* as Old Church Slavic *inogz̥* vs. *inokz̥* ‘solitary’?

### 5.7. \**tk<sup>w</sup>eiH-*

The liquid by-product of cheese production is whey, for which Rasmussen (1990) assumed that ramifications of a common stem have survived in Germanic and Indo-Iranian. Most likely, Old English *whæg* ‘whey’ goes back to \**tk<sup>w</sup>oiH<sub>1</sub>o-* with *o*-grade in the root as opposed to the derivatives Vedic *kṣīrā-*, Persian *šīr* ‘milk’ < \**tk<sup>w</sup>iH<sub>1</sub>ro-*, to which may be added Albanian *hirrë* ‘whey’ < \**tk<sup>w</sup>iH<sub>1</sub>-r<sub>1</sub>nah<sub>2</sub>-* (?),<sup>35</sup> as posited by Kroonen (2013: 261–262).<sup>36</sup> The Indo-Iranian and Albanian forms may be seen as possible derivatives of a heteroclitic (\**tk<sup>w</sup>oiH<sub>1</sub>-r<sub>1</sub>*), \**tk<sup>w</sup>iH<sub>1</sub>-n-ós*, which would explain the variation in the stem formation, especially the Albanian reflex of \**-r<sub>1</sub>-n-* that seems to combine the two stem alternants.<sup>37</sup> One may speculate whether the root is an extension of \**tek<sup>w</sup>-* ‘run, flow’ (LIV 620–621) as a semantic parallel of Latin *serum*, Greek *ὀρός*, also ‘whey’.

### 5.8. Armenian *kat<sup>c</sup>n*, Old Irish *bannae*, *bainne*

The interpretation of the following word group presents serious difficulties: Rasmussen (1999) ingeniously suggested that Armenian *kat<sup>c</sup>* (*i-* and *o*-st.) ‘drop’ and *kat<sup>c</sup>n* (*n*-st; gen. *-in*) ‘milk’<sup>38</sup> would be most naturally connected with Old Irish *bannae* ‘drop’, later *bainne* ‘drop; milk’,<sup>39</sup> Middle Cornish *banne*, Middle Breton *banne*, *bannech* ‘drop’.

<sup>35</sup> A connection between *kṣīrā-* and *hirrë* is assumed by Huld (1984: 75), and Orel (1998: 149), while Demiraj (1997: 202) seems to hesitate between this solution and a linking with Icelandic *skyr* etc. For semantic reasons the first option seems preferable.

<sup>36</sup> Rasmussen’s reconstruction of the root as \**kḥueiḥ-* was probably inspired by the explicit comparison with Avestan *xšuuīdām-*, of which the traditional translation ‘milk’ is, however, erroneous (Jamison 2011 [2015]). Thanks to an anonymous reviewer for the reference.

<sup>37</sup> Alternatively, Kroonen (2013: 261–262) assumes a basic alternating *i*-stem.

<sup>38</sup> On the traditional, but formally problematic comparison with Greek *γάλα*, Latin *lac*, cf. Martirosyan 2008: 345–346.

<sup>39</sup> Registered as being ‘without etymology’ by LÉIA B–8. Cf. also Matasović 2009: 54–55.

In Armenian, *kat<sup>c</sup>n* is abundantly attested since the oldest period. *Kat<sup>c</sup>*, which is at least internally connected with the verb *kat<sup>c</sup>em* ‘drop, trickle’, also known from 5th-century texts, is especially used about water, dew, tears, but also blood, honey etc. Thus, there is no particular reason to assume an original etymological connection between the two. Moreover, the semantic correspondence between Armenian and Celtic is not quite smooth since *kat<sup>c</sup>n* only means ‘milk’ while the primary meaning in Celtic is clearly ‘drop’.

According to Rasmussen, the protoform of *kat<sup>c</sup>n* is *\*g<sup>w</sup>ə<sub>1</sub>tsnah<sub>2</sub>-* whence the secondary derivative *\*g<sup>w</sup>ə<sub>1</sub>tsniah<sub>2</sub>-* > *\*basniā* > *bannae*. The reason for positing *\*h<sub>1</sub>* was an assumed relationship on the one hand to Armenian *kit<sup>c</sup>* (o-st.), defined in Ačāryan’s dictionary (HAB: 585) as ‘produce from domestic animals, milk, eggs or butter’, and on the other with Faroese *kváð* ‘sticky juice coming from the teats of a cow’. The aspirate *-t<sup>c</sup>-* in *kit<sup>c</sup>* presupposes an older *\*t<sup>b</sup>*, i.e. a laryngeal cluster, whether *\*-t-+ -h<sub>1/2</sub>-* or *\*-h<sub>1/2</sub>- + -t-* by the principle of laryngeal metathesis as stipulated in Olsen 1989 and later works. However, since the laryngeal appears in its vocalic form in *kat<sup>c</sup>* and *kat<sup>c</sup>n*, Rasmussen had to assume that *-t<sup>c</sup>-* was here analogically transferred from *kit<sup>c</sup>*.

To this solution one may object that the broad meaning of the rather scarcely attested Armenian *kit<sup>c</sup>* makes it unlikely that it was originally a dairy term, cf. e.g. *aygekit<sup>c</sup>k<sup>c</sup>* ‘produce from the vineyard’ or *hawkit<sup>c</sup>* (‘chicken-produce’, i.e.) ‘egg’. One must therefore agree with Ačāryan (l.c.) that “from the same root, another form is *kut<sup>c</sup>* (o-st.)”. The latter is known from early attestations in the Bible and the 5th-century author Agathangelos in the meaning ‘harvest, vintage’. Internally, it is connected with the denominative verb *kt<sup>c</sup>el* ‘reap, harvest’, but also ‘milk’, likewise well attested, e.g. 1.Sam.8.12: *kt<sup>c</sup>el z-kut<sup>c</sup>s nora* ‘to reap his harvest’. For the interpretation of *kut<sup>c</sup>* (*k<sup>c</sup>*), I have suggested (Olsen 1999: 39) a substantivized *\*-to-*participle *\*guh<sub>1/2</sub>-to-* from the root *\*g<sup>(w)</sup>euH-* (LIV 189) as in Lithuanian *gáuti* ‘reach, get’. The side form *kit<sup>c</sup>*, on the other hand, may easily have been created as a retrograde formation based on either the oblique cases of *kut<sup>c</sup>* (gen.pl. *kt<sup>c</sup>oc<sup>c</sup>*) or on the verb *kt<sup>c</sup>el* due to the regular syncope of both *-u-* and *-i-* in unaccented syllables.

Consequently, it appears that the Germanic terms with lengthened grade, Faroese *kváð* ‘viscous fluid from a cow’s teat’, Norwegian dial. *kvaada*, *kōda*, *kōa* ‘raw milk’ etc., have no direct external match.

Rather, as is generally assumed, the basic meaning must be something like ‘resin’, as is still the case of Icelandic *kváða*, Swedish *kåda*.<sup>40</sup> More specifically, Darms (1978: 49–53) has demonstrated that we are dealing with vṛddhi-derivatives of a *u*-stem *\*g<sup>w</sup>etu-* as continued in e.g. Old English *kwidu* ‘cud’ and Sanskrit *jatu-* ‘varnish, gum’. Thus, the use of *\*g<sup>w</sup>ētV-* in the context of sticky fluids coming from cows’ udders is secondary, due to similarity with resin in texture and colour, somewhat like Greek *πῦός* ‘beestings, colostrum’ from *πύον*, *πύος* ‘pus’.

This, then, leaves Armenian *kat<sup>n</sup>* and Old Irish *banna* on a side track. While the Irish form must still be considered etymologically obscure, it is possible that *kat<sup>n</sup>* ‘milk’ was secondarily influenced by *kat<sup>c</sup>* ‘drop’, *kat<sup>c</sup>em* ‘drop, trickle’, itself of unknown origin,<sup>41</sup> which would be reminiscent of the situation in Celtic, perhaps in combination with the word corresponding to Latin *lac*, Greek *γάλα*, from which one may at least defend an initial *\*g-* > *k-*.

Quite tentatively, one might suggest an original connection between the noun ‘milk’ and the adjective (*\*s<sup>w</sup>ah<sub>2</sub>do-* >) *\*s<sup>w</sup>ādo-* ‘sweet’. A protoform *\*s<sup>w</sup>ād-no-* ‘a sweet substance’ would regularly yield *\*k<sup>c</sup>at-n-*, whence *kat<sup>n</sup>* with secondary reversal of the modes of articulation aspirate and plain voiceless stop, i.e. *k<sup>c</sup> – t* → *k – t<sup>c</sup>*, by some sort of “blending” – whether with the word for ‘drop’, the predecessor of *γάλα* or both. Clackson (2017) has presented an impressive collection of 49 likely examples of blending or contamination in Armenian where this phenomenon for some reason seems to be particularly frequent, cf. e.g. *taygr* ‘brother-in-law’ : *\*cal* → *tal* ‘sister-in-law’, or *dustr* ‘daughter’ : *\*suH-* → *ustr* ‘brother’.<sup>42</sup>

If we follow this basic idea, *kat<sup>n</sup>* ‘milk’ would be a secondary derivative of *\*s<sup>w</sup>ādm<sup>n̥</sup>-* (n) / *\*s<sup>w</sup>ādmón-* (m) ‘sweetness’, as in Vedic *svād-man-/svādmán-*, Old Swedish *sótme*, Danish *sødme*. In RV 1.69.3,

<sup>40</sup> Hellquist 1980, 1: 542; Magnússon 1989: 530; Kroonen 2013: 315–316.

<sup>41</sup> It may be noticed that *kat<sup>c</sup>* shares its initial *ka-* with *kaylak* ‘drop’, apparently *\*kali-* > *\*g<sup>(w)</sup>l(b)i-* with diminutive suffix *-ak*, which may be related to Sanskrit *gulikā-* ‘(small) ball, globule’ (Olsen 1999: 244; probably from *\*g<sup>w</sup>elH-* ‘trickle’, LIV 207), and its final *-t<sup>c</sup>* with yet another synonym, *šit<sup>c</sup>* ‘drop’ (perhaps < *\*sheh<sub>1</sub>t-*, cf. Latin *scatō* ‘gush forth’, Olsen 1999: 207).

<sup>42</sup> The adjective *k<sup>c</sup>at<sup>c</sup>r* itself with the synchronic meaning ‘sweet’ would be another telling example (Clackson 2017: 103–104 with reference to de Lamberterrie 1990: 502): first merger of the two adjectives *\*s<sup>w</sup>ah<sub>2</sub>du-* ‘sweet’ and *\*saldu-* ‘salty’ > *\*s<sup>w</sup>aldu-*, and then a final merger with *\*dlukū-* (cf. Gk. *γλυκύς* ‘sweet’).

*svā́dman-* is specifically used in connection with what comes from the cow's udder, i.e. milk:

*udhar ná gónām svā́dmā́ pitū́nām*

'like the udder of cows he is the sweetness of foods'

Likewise, whole milk, due to its high content of lactosis, used to be called 'sweet milk' in English, as is still the general term in Danish, *sødmælk*.

The above-mentioned list of examples is far from exhaustive, as I have confined myself to lexemes whose early semantic specialization as dairy terms is reasonably certain. Thus, the cognates of Vedic *sarpīṣ-* 'clarified butter', Albanian *gjalpë* 'butter' include Old High German *salba* 'ointment', and Old Irish *imb*, Old High German *ancho* and Old Prussian *anctan* 'butter' are related to Latin *unguen* 'fat, grease', so that we might be dealing with later, independent lexical narrowings. The same goes for Tocharian B *kewiye*, Armenian *kogi* 'butter' as opposed to the more general Vedic adjective *gāvya-* 'consisting of cattle, pertaining to cows, coming from a cow'.

## 6. Dairy-related verbs

It is not only this impressive inventory of nouns denoting dairy products that have a long history behind them. There are also verbs that describe the working processes. The most striking, beside the basic word for 'milk', must be *\*mentH-* 'churn', which will need a specific treatment. Another root that is relevant in this context is *\*g<sup>h</sup>er-* 'sprinkle', as discussed in more detail by Olsen (2011). As a finite verb, the only relic is found in Vedic *\*ghṛ-* with present *jígharti*. Thus RV 2.10.4 with an apparent *figura etymologica*:

*jígharmy agnīm havīṣā ghṛtēna pratikṣiyántam bhuvanāni víśvā ...*

continued in the following stanza:

*ā víśvataḥ pratyāñcam jígharmy arakṣasā mānasā táj juṣeta*

for which I have suggested the following translation: 'I besprinkle Agni with sprinkled libation ... I besprinkle him',<sup>43</sup> where *ghṛtá-* is

<sup>43</sup> As opposed to e.g. Jamison & Brereton who follow the traditional interpretation with an asyndetic construction: "I sprinkle Agni with a libation, with ghee ...".

interpreted as the passive participle of *jígharti*,<sup>44</sup> only secondarily lexicalized in the neuter as ‘clarified butter, ghee’, and often used in connection with *mádhu* ‘sweet substance’ or *páyas-* ‘milk’, thus RV 7.95.2:

*ghṛtám páyo dudube*

‘they yield sprinkled milk’ (rather than ‘ghee and milk’).

Similarly, RV 9.31.5:

*túbhyaṁ gāvo ghṛtám páyo bábhro duduhré akṣitam*

‘For you, o brown one, the cows have yielded imperishable sprinkled milk’,

and RV 9.74.4:

*ātmaván nábho duhyate ghṛtám páyah*

‘the embodied cloud is milked of sprinkled milk’.

In all three cases, *páyah* is connected with the verb *dub-* ‘yield milk’. Obviously ghee does not come directly from the cow’s udder, so here the interpretation of *ghṛtám* as a verbal adjective ‘sprinkled’ rather than a noun ‘ghee’ in asyndetic position seems most likely.

As a close match of *mádhu* + *ghṛtám* in Vedic, we have the Greek compound *μελιχρός* ‘honey-sprinkled’ < \*-*g<sup>h</sup>ró-*, pointing to a predialectal poetic phrase.

A third important piece of evidence comes from Celtic where Middle Irish *gert* < \**g<sup>h</sup>értah<sub>2</sub>*-, apparently a full-grade collective corresponding to the zero-grade neuter \**g<sup>h</sup>rtóm*, is a joint designation of ‘by-products of cattle, milk or manure’. Here a similar idea is expressed by Sanskrit *pañcagavya-* (Lex.) ‘complex of five cow-products’, i.e. ‘milk, coagulated/sour milk, butter, liquid and solid excretes’. In the same vein, Vedic *ghṛtá-* is also used in connection with *vár* ‘water’, understood as the urine or semen of bulls or horses, thus RV 10.12.3: *divyám ghṛtám vāḥ* ‘the heavenly sprinkled water’ (not ‘the heavenly ghee, the water’) or RV 10.99.4: ... *ásvāsa írate ghṛtám vāḥ* ‘... horses let their sprinkled water (urine) stream’. Despite the somewhat modest evidence, it thus seems reasonable to conclude that all products coming from cows were considered valuable, be it milk that could be processed to curds, butter or cheese, urine that came in handy for washing – \**muHtlo-* > Vedic *mútra-* ‘urine’, Avestan *mūθra-* ‘dirt’, Czech *mýdlo* etc. ‘soap’ – or

<sup>44</sup> Cf. Grassmann 1964: 423.

even dung, which was probably used for burning. In particular, the substantivized participle *\*g<sup>b</sup>rtóm/*\*g<sup>b</sup>értab<sub>2</sub>* from the root *\*g<sup>b</sup>er-* ‘sprinkle’ seems to have been lexicalized already in Core Indo-European as a designation of liquid by-products of cattle, whether milk or urine.*

## 7. Conclusion

To early Indo-European societies, the cow was as much a defining feature as the horse. It was the fixed point of their daily lives, a symbol of wealth and status and a constant source of nourishment. However, by the order of nature, it has not always been possible to take uninhibited advantage of this nourishment. As the largest part of the world’s population above the age of infancy is incapable of digesting milk, societies relying on animal husbandry have always been compelled to adapt to the situation.

As recently discussed by Segurel et al. (2020) in continuation of earlier studies (cf. in particular Allentoft et al. 2015), two models of adaptation have been observed. Either the population in question could perfect methods to produce fermented products such as curds, butter or cheese that can be digested without major problems, or they could develop lactase persistence. The first scenario – cultural adaptation – is seen among cattle breeders in western Asia such as the Kazakhs, while the second – biological adaptation – spread with what is now associated with the migrations of Indo-European speaking populations.

Garnier, Sagart & Sagot (2017) correctly observe that a common word for ‘milk’ or ‘milking’ cannot be traced back to Proto-Indo-European, as the root *\*h<sub>2</sub>melǵ-* is unknown in Anatolian. However, their conclusion that “the ability to digest milk in adulthood played an important role in boosting Proto-Indo-European demography” is simplified and cannot be corroborated by linguistic data. On the contrary, while we know that the knowledge of milking must at least go back to Proto-Indo-Tocharian, the evidence for a specific word for the substance ‘milk’ is scarce. What we do find, are various independent creations in the separate branches beside a multitude of technical terms for the processing of milk into curds, butter and cheese including by-products such as whey. In many cases, these terms go back to at least “Core Indo-European” including Italo-Celtic, and they are typically created from known verbal roots such as ‘curdle’, ‘be fat’, ‘separate’, ‘flow’ or ‘stir’ through archaic procedures of word formation.

This state of affairs rather leads to the conclusion that by the time of the first wave of Indo-European migrations, the ability to digest fresh milk was not yet fully developed, and when the dairy vocabulary based

on inherited elements is particularly rich in Germanic, Baltic and Indo-Iranian, this is most naturally seen in relation to the high percentage of lactase tolerance among the populations of Northern Europe and the North of India.

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