

Code Book | Selected Codes & Definitions for Supplementary Material

Code Group	Beekeeping	
Code Number	Code	Description
1	Defining beekeeping	Indicates that the participant is defining beekeeping as it is seen by them, not reciting a standard definition.
2	Expressing enjoyment from beekeeping	Indicates a moment of expressing joy from their beekeeping practices, can be in multiple instances, or way showing joy.
3	Reasons for starting beekeeping	Indicates a reason why they starting to getting into beekeeping, normally within a longer narrative.
4	Claiming beekeeping as a hobby	Indicates a moment wherein the participates declares beekeeping as a hobby, this is often done to create distance/ downplay from beekeeping as a profession
5	Having another job outside of beekeeping	Indicates the job(s) the participant had outside of beekeeping
6	,hard to be only a beekeeper'	Indicates the struggles of trying to make profit from beekeeping, ususally only possible on a large scale
7	Becoming an official master of beekeeping	Indicates the participant is a master of beekeeping, a title that takes year of training in Austria, and often was a source of pride and expertise claims
8	Having set backs	Indicates stories of struggles that the participant encounters during their routine beekeeping practices
9	Discussing poor beekeeping practice	Indicates a personal story that is used to highlight bad beekeeping practices, used by the participant distance themselves
10	Highlighting bad practice amongst experienced beekeepers	Indicates a personal story that is used to distance themselves from other experience beekeepers, i.e., experience does not equate expertise
11	Displaying knowledge of bee viruses	Indicates a moment wherein the participant explain honey bee viruses and thus displayed their knowledge, again showing the depth of their expertise
12	Quantifying the frequency of visits to the bees	Indicates the participant quantified the amount of times they visited their colonies, this is often coupled with their description of how active they are with their bees, the quantification is used to help solidify
13	Quantifying number of colonies	Indicates where the beekeepers talked about the number of their hives, which was often brought of freely as a way to show how invested they were in beekeeping
14	Describing the location of colonies	Indicates the participant describing the location surrounding their colonies. Oftentimes beekeepers know the surrounding area and put a lot of thought/ care into the surroundings, knowledgable.
15	Moving bees around	Indicates the participant describing an instance where they needed or choose to move their colonies, again, a lot a thought went into this and was done for various reasons, contamination, environment, etc.
16	Preventing swarming	Indicates the participant describing the methods they use to prevent swarming, a task/skill needed by all beekeepers and takes care/ observation to understand. Again shows their interest and expertise.
17	Buying queens	Indicates the participant describing an instance where they bought queen bees for their colonies, raising your own queens is considered extremely difficult and is done only by a few.
18	Having opinion about organic beekeeping	Indicates a participant expressing an opinion about organic beekeeping, a current trend in beekeeping, which is very polemic in the community
Code Sub-Group: selling bee products		
19	Selling bee products	Indicates the participant was describing an instance where they sold bee products
20	Discussing the importance of honey production	Indicates the participant was describing the imporantance of honey production, not only for them but in general, the benefits of honey and the risk of bee population decline.
21	Discussing the selling of honey	Indicates the participant describing the selling of their honey and the struggles that go along with it, oftentime there are complications and large amounts of honey are produced from their hives
22	Winning awards—honey	Indicating the participant describing a time where they won awards for their honey, this was a way of showing their expectional ability in beekeeping and their expertise
23	Discussing marketing problems	Indicating the participant describing a struggle they had with the marketing of their honey
24	Hightlighting the importance of marketing	Indicating the participant discussing the importance of marketing honey and how this effects the general public/ consumers.

Code Group	Beekeeping Community	
Code Number	Code	Description
25	Giving reasons for joining a beekeepers association	Indicates the participants reasoning for joining a beekeepers association.
26	Being drawn deeper into beekeeping communities	Indicates the participants reasoning for embedding themselves further into their beekeeping communities as well as their feelings of being drawn into these communities, e.g., beekeeping as an addictive past time
27	Belonging to a beekeeper's association	Indicates the participant belongs to a beekeepers association, which is often seen as showing they are involved in their local community.
28	Attending beekeeper events	Indicates the participant signaled that they attend various beekeeping events as part of the community or to further their knowledge of beekeeping.
29	Going to a beekeeper conference	Indicates the participant signaled that they attend conferences for beekeepers to futher their knowledge of the fields and to keep updated.
30	Being on the board of a beekeeper association	Indicates that the participant sits on the board of their beekeeper association, this often was used to show how involved they were in their community as well as the prestige that comes with it.
31	Teaching beekeeping	Indicates that the participant was a teacher of other beekeepers, which was often used to show involvement and how knowledgable they were of beekeeping practices, as well as how they shared their passion.
32	Teaching beekeeping—to youth	Indicates that the participant taught beekeeping to children. Often seen as spreading knowledge of bees and enjoyment of them/ beekeeping.
33	Acquiring knowledge through exchange with colleagues	Indicates a moment wherein the participant describes acquiring knowledge through an exchange with a colleague, often occuring during a time of need.
34	Going to specific people for specific problems--specialist	Indicating the participant had a good general overview of their local beekeeping community and who was knowledgable about what and who to turn to, i.e., who was willing and able to help.
35	Asking for advice--specialists	Indicates the participant describing a moment where they went to a specific person that they considered a specialist for help, this specialist could also be in another country, connected by informal networks.
36	Asking for advice—at schools	Indicates the participant describing a situation wherein they went to a school for help in solving a problem, often showing the beekeeper did not know the community well and was less embedded in local beekeeping.
37	Displaying a hierarchy amongst beekeepers in community	Indicates a moment wherein the participant discusses the implicit hierarchy in the community, they usually do this to show their place within the community.
38	Discussing poor beekeeping	Indicates the participant brought up a moment where they observed what they would call poor beekeeping. This was ususally in combination with disucssions about colony contamination.
39	Recognizing inexperience	Indicates the participant describing moments and in what way they know someone is inexperienced in beekeeping.
40	Displaying frustration with other beekeepers	Indicates a moment wherein the participant was showing frustration with other beekeepers
41	Creating distance from bad practices	Indicates a moment wherein the participant was making a statement to create distance between their practice and those of bad beekeeping ones.
42	Declining of forums	Indicates the participant describing the decline of beekeeping forums, which many stated they used previously to find solutions.

Code Group	Bee Health/ Contamination	
Code Number	Code	Description
43	Suspecting contaminants	Indicates a moment wherein a participant describes an instance where they had suspected contamination of their colonies, something that is quite common.
44	Claiming sources of pesticide contamination	Indicates a moment that the participant is describing sources of contamination that they were currently struggling with, does not have to be an accepted source.
45	Citing high contamination	Indicates the participant claiming that certain areas are high contaminated for these bees.
46	Displaying knowledge of urban hazards	Indicates the participant is very knowledgeable about their surroundings, this time in an urban environment.
47	Highlighting the importance of plant diversity	Indicates an instance where the participant stresses the importance of plant diversity for the health of bees, often in correlation with green deserts
48	Discussing green deserts	Indicates a moment wherein the participant was describing green deserts, a very green area with little foraging potential for bees, often because native plants have been eliminated.
49	Describing monoculture as harmful (pesticide contact)	Indicating that a participant stressed the effects monoculture for bees, which they see as harmful.
50	Highlighting the need for pesticides	Indicating the participant, although citing the harmful effects of pesticide on bees, did concede that pesticides are necessary for farming, describing it as a balance or a place for further discussion with farmers.
51	Taking steps to prevent disease	Indicating the participant was taking steps to prevent disease, this was also done in many different ways, some which were only proven effective anecdotally.
52	Moving bees to avoid contamination	Indicating one of the ways that the beekeepers went about protecting their bees. Simply moving them.
53	Taking action oneself	Indicates a moment wherein the participant felt like they had to take action themselves and could not rely on official sources, often in combination with contamination stories.
54	Citing annoyance	Indicates that the participant was describing an instance or a happening that was giving them grief in terms of their bees.
55	Highlighting tension with farmers	Indicating the participant recounting a struggle they had with local farmers.
56	Bringing up concerns with farmers	Indicating the participant describing an incident where they confronted farmers in their area
57	Making a deal with farmers	Indicating the participant describing an incident where after a confrontation with a farmer, they made a resolution and a deal to potentially resolve the issue at hand.
Code Sub-Group: Colony Loss		
58	Discussing problems with colony loss	Indicating the participant was describing a time where they had experienced colony loss.
59	Qualitatively describing colony loss	Indicating the participant was describing colony loss qualitatively, something that have more to do with lived experience than what might be counted as evidence.
60	Quantifying colony loss	Indicating the participant was describing colony loss quantitatively, something that often was coupled with trying to justify their more qualitative claims.
61	Noticing an increase in colony loss	Indicating the participant was highlighting their perceived rise in colony loss
62	Experiencing loss of bees	Indicating the participant described personally experienced having gone through colony loss.
63	Claiming multifaceted cause to colony loss	Indicating the participant reflected on the many causes of colony loss and their legal combination, often not considered fully in scientific literature at the time.
64	Citing side effects of bees of climate change	Indicating the participant reflecting on the climate changing and how this is effecting the patterns in their bees.
65	Linking colony loss with pesticide use	Indicating the participant linking pesticide use with colony loss.
66	Avoiding colony loss due to location	Indicating the participant described being able to avoid colony loss when they were able to moved their colonies to a proper location.

Code Group	Care	
Code Number	Code	Description
67	Giving agency/ anthropomorphizing the bees	Indicates the participant discussing their bees and giving them human like traits. Often showing how much they consider their bees.
68	Bees learning	Indicating a moment where the participant describes their bees learning and learning from each other.
69	Thinking in terms of flight radii	Indicating the participant displayed a thinking mindset in line with how far bees can typically fly from their colony, showing the beekeeper thinking like a bees so to say.
70	Feeling connection with bees	Indicating the participant showing a feeling of being connected to their bees, in many different forms.
71	Bees getting hungry	Indicating the participant describing the moments where their bees were getting hungry, often used as a way to show they were displeased how their bees were interacting with the sampling devices.
72	Bees getting annoyed/ aggressive	Indicating a moment wherein the participant was discussing their beeing becoming annoyed and therefore more aggressive, a human like reaction, often in combination with perceived displeasure with one of the sampling devices.
73	Changing patterns to help bees	Indicating the participant describing the steps they took to make the bees happier, often going great lengths to orient themselves to the needs of the bees.
74	Quantifying amount of time spent with bees	Indicating the participant quantified the amount of time they spent with their bees, often to show just how much they invested in them.
75	Beekeeping as a lobbyist	Indicating that the participant felt through their connection with their bees that they need to lobby for their futures, as bees were seen as having uncertain futures.
76	Beekeeping as mediation	Indicating the participant discussed how they feel a sense of mediation when they are working with their bees or just spending time around their hives.
77	Choosing idyllic place for test hives	Indicating the participant's decision on where to place the colonies, either because they thought the bees would be stressed and therefore needed a nice place or because they wanted interesting samples for the scientists.
78	Citing temporal regimes in beekeeping	Indicating the participants claims of the temp of their days being regulated by the tempos of the bees and their needs.
79	Telling a story about beekeeping	Indicates the participant telling a story about beekeeping, often in a very adoring way.
80	Taking steps to avoid disease	Indicating the participant describing the great lengths they went through to avoid their bees getting disease.
81	Discussing the health benefits of beekeeping	Indicating a moment in which the participant describes the health benefits of keeping bees.
82	Sharing beekeeping with the family	Indicates the participant describe how they share their passion for beekeeping with their family, all had children.
83	Highlighting the lack of care by other beekeepers	Indicating the participant described the lack of care by other beekeepers, often used in contrast to their caring practices.

Code Group	Project	
Code Number	Code	Description
84	Being a good scientist	Indicating the moment where the participant described values of what a good scientist is.
85	Communicating with scientists	Indicating the participant describing moments in which they were communicating with the project scientists.
86	Participating—showing eagerness to participate	Indicating the a moment wherein the participant was displaying eagerness to participate.
87	Participating—showing indifference	Indicating a moment wherein the participant was showing indifference toward their participation, sometimes this overlapped with eagerness depending on the topic, task or place in the project.
88	Choosing strong hives	Indicating the participant's reasoning for choosing strong hive for the INSIGNIA project.
89	Selecting ones hives for the project	Indicating the participant's though processe while choosing which colonies to include as test hives in the project.
90	Wanting more from the beginning	Indicating a moment where the participant express a desire to have more from the project in various ways fro the start.
91	Citing problems with implementation	Indicating the descriptions given by the participants of the problems they had with implementation.
92	Citing problems with sampling	Indicating the descriptions given by the participants of the problems they had with sampling.
93	Taking samples for testing	Indicating the descriptions given by the participants of the taking of samples.
94	citing problems collecting samples	Indicating the descriptions given by the participants of the problems they had with collecting the samples, i.e., taking out/exchanging the devices properly.
95	Wanting more standardization for beekeepers in the project	Indicating a shown desire by the participant for more standardization for the beekeepers in the project.
96	Wanting a better idea of how beekeepers can communicate	Indicating a shown desire by the participant for more communication/ way to communicate for the beekeepers in the project.
97	Showing an expectation of the outcomes	Indicating the participants expectation for project outcomes.
98	Looking forward to test results	Indicating the participants excitedness for the results, often having real impact for them and their colonies.
99	Being surprised by results	Indicating the participant describing their surprise at the results/ outcomes of the project.
100	Giving feedback	Indicating a moment wherein the participant was giving feedback on the project and the process
101	Suggestion for next year	Indicating the participant made a suggestion for the next season.
102	Looking forward to the second season	Indicating that the participant expressed that they were looking forward to next year
103	Citing partitcpation in previous projects	Indicating the participant discussed being involved in other projects.
Code Sub-Group: Motivations for Participation		
104	Citing motivation of participation—test results	Indicating the participant claimed the test results as a motivation for participation.
105	Citing motivation of participation—interest	Indicating the participant claimed personal interest as a motivation for participation.
106	Citing motivation of participation—curiosity	Indicating the participant claimed personal curiosity as a motivation for participation.
107	Citing motivation of participation—ask to join/ exchange for results	Indicating the participant claimed being asked personally as a motivation for participation.

Code Group	Relation to Science	
Code Number	Code	Description
107	Participating—scientific bee studies	Indicating the a moment wherein the participant was displaying eagerness to participate.
108	Participating—being at Science's disposal	Indicating the a moment wherein the participant was displaying a belief that they were at the disposal of science, not intended to be a good or bad qualifier, but instead that they did what science needed.
109	Recording data on their bees	Indicating that the participant indicated they record data on their bees.
110	Collecting data outside of formal scientific research	indicating the participant collected data on their bees outside of what was expected of them in a formal research project.
111	Writing up informal reports	Indicating the participant wrote up reports, using their data outside of any official research project.
112	Presenting anecdotal evidence	Indicating a moment wherein the participant share anecdotal evidence, which although sometimes powerful, could not be substantiated
113	Being invited/ called upon personally by a scientist	Indicates the participant described a situation where they were ask personally by a scientist to do something for them, creates a sense that they see themselves on the same level as the scientists.
114	Thinking holistically	Indicates a moment where the participant was thinking of a situation that goes beyond what would be described by scientific reflection.
115	I am a beekeeper not a scientist	Indicates the participant express that they were not a scientists, they do not see themselves as a scientist
116	Not able to judge because not a scientist	Indicating an instance wherein the participant expressed they were not qualified to answer a certain question or speak to a certain phenomenon as they are not a scientists.
117	Scientists dont need knowledge of beekeeping	Indicating the participant expressing a belief that science did not need to know about certain aspect of beekeeping because it was not relevant to them.
118	Displaying familiarity with scientists	Indicates a moment wherein the participant displayed familiarity with the scientist, often discussed to show they were good friends.
119	Hightlighting gaps in the knowledge of scientist	Indicating the participant hightlighted a preceived gap in what the scientists know about the bees.
120	Finding aspects of research problematic	Indicating the participant found a certain parts of the research problematic.
121	Putting science above themselves/ authority of science	Indicating an instance wherein the participant place the authority of science above there own.
122	Drawing on the authority of science	Indicating an instance wherein the participant drew upon the authority of science in their claim
123	Distancing oneself form science	Indicating an instance wherein the participant distance themselves from science by making it apparent they were not a part of it or did not partake in certain aspects.
124	the bees are better without science'	Indicating the participant's belief or statement that the bees are better without science sometimes, e.g., the beekeepers know better
125	Hightlighting struggles with scientists	Indicating the participants hightlighting their struggles with the scientists in the project, often repeated themselves to stress.
126	Arguing quantitatively	Indicating the participant was agruing for a certain point quantitatively, something that is consider more scientific traditionally.
127	Being presented with the facts	Indicating the participant describing a situation wherein they were simply presented with the facts, something that was offend unidirection from science on to them, not a lot of room for questioning the facts.
128	Science as violence	Indicating the participant expressed that science can be violent towards the bees as in they care about the results of the study and not about the health of their individual hives, while the beekeepers care about their hives, no just outcomes, this was apparent in some of the devices that led to the bees being killed
129	Science showing what is really there	Indicating the participant discussing science's ability to show what is really there, for example things that cannot be seen like contamination in their hives.
130	Confronting scientists	Indicating the participant describing a situation where they confronted a scientist, not alway within the context of the project.

Code Group	Learning/ Knowledge Aquisition	
Code Number	Code	Description
131	Asking specialized questions	Indicating the moment wherein the participant was describing the very specific questions they had for the scientists, showing that they are knowledgeable.
132	Highlighting a desire to know	Indicating the participant was displaying a strong desire to know.
133	Describing the surrounding land areas	Indicating the participant was describing in detail the surrounding area of their hives, often showing a high level of local knowledge.
134	Displaying knowledge of the surrounding areas	Indicating the participant was displaying a high level of knowledge about their surroundings.
135	Displaying knowledge of plants their bees come in contact with	Indicating an instance wherein it was apparent that the participant had a thorough knowledge of the things their bees came in contact with.
136	Making a point with numbers	Indicating an instance wherein the participant was making a point with numbers, often seen as more scientific and thus more believable.
137	Displaying knowledge of problems	Indicating an instance that showed the participant had a deep understanding of the problems their bees were facing.
138	Having a family history of beekeeping	Indicating the participant claim they had a family history of beekeeping.
139	Learning by doing	Indicating the embodiment of beekeeping and learning in beekeeping, often done as you go, by doing.
140	Providing examples of inexperience	Indicating a moment where the participant detailed an instance of themselves or another beekeeper showing inexperience.
141	Implying expertise	Indicating a moment where the participant intentionally or not display their own expertise
142	Displaying knowledge of beekeeping	Indicating a moment where the participant intentionally or not display their knowledge of beekeeping.
143	Learning from mistakes	Indicating an instance where the participant describes learning from their mistakes.
144	Being unsure of quality of knowledge source	Indicating a moment wherein the participant describes being unsure of a source of information, often linked to inexperience.
145	Sharing knowledge with other beekeepers	Indicating a moment where a participant describes sharing their knowledge with other beekeepers.
146	Getting information/learning from scientist	Indicating a moment wherein the participant describes learning from a scientist, not necessarily in the project.
147	Citing lack of access to research journals	Indicating a moment where a participant describes a time when they could access research journal information they wanted to read.
Code Sub-Group: Acquiring Knowledge		
148	Acquiring knowledge through lectures	Indicating the participant describing how they acquired knowledge through lectures.
149	Acquiring knowledge through research journals	Indicating the participant describing how they acquired knowledge through research journals.
150	Acquiring knowledge through personal data collection	Indicating the participant describing how they acquired knowledge through personal data collection.
151	Acquiring knowledge through books	Indicating the participant describing how they acquired knowledge through books.
152	Acquiring knowledge through courses	Indicating the participant describing how they acquired knowledge through courses.
153	Acquiring knowledge through teaching	Indicating the participant describing how they acquired knowledge through teaching.
154	Acquiring knowledge through digital sources	Indicating the participant describing how they acquired knowledge through digital sources.
155	Acquiring knowledge through participation in projects	Indicating the participant describing how they acquired knowledge through projects.