Food retail supply shortages. Conceptual development of food deserts from a German perspective

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Abstract
More and more frequently supply gaps or even food deserts are unveiled when customers want to go shopping for groceries in neighbourhood areas. This development can be observed in both rural and urban areas, which have lost a tremendous part of their retailing infrastructure over the last years owed to demographic change taking place in the global north. Normally supermarkets, discount stores and village shops are identified as solutions against this thinning out process, but which only cater to traditional planning and policy principles and profit-orientated perspectives of the real estate industry, developers, retail suppliers and municipalities. Neither of these agents challenge the traditional understanding of local supply and central theory, nor do they ask if this concept of local supply produces (new) losers and who they are. The food desert concept, originally from the UK and the USA, targets those areas and is directed at answering to those questions. The focus of this paper is on the (re)-conceptualizing and enhancing the theoretical understanding of food deserts.

Keywords: local grocery retailing, food desert concept, food governance

1. Introduction

In the global north, local food retail supply shortages are gaining prevalence with demographic ageing and shrinkage, both in rural and urban areas. It is not only that the number of potential customers is shrinking; households are getting smaller and consumer behaviour is changing with stagnating or even declining disposable incomes. The suppliers of retail services respond with closures, concentrate their business endeavours, increase individual retail sales areas and concentrate their business in terms of space and product range, locating together with competitors on a few highly frequented plazas. Local retail supply in terms of corner shops, kiosks, small rows of shops in residential areas, petrol stations, family-run bakeries, butcher shops, and fruit and vegetable markets are no longer present in the biographies of younger generations. The concepts of "near" and "far" (5-7 minutes walking time in ideology-based supply planning) are being reinvented based on accessing stores with an automobile rather than on foot, regardless whether this is defined from home or elsewhere.

2. Research questions and state of German research

This restructuring of supply and demand has led to a thinning process or a total loss of retail infrastructure primarily in large rural areas and, considering coming demographic changes, has not yet reached its peak. It is furthermore intertwined with traditional ideals of quality of life, acceptable living conditions and centrality concepts. For decades, this development has been studied in numerous research waves and across disciplines and has developed an applied political and civil planning profile that focuses on searching for alternative retail forms [1]. The search for quick-fix "solutions" to ensure secure local retail supply in Germany [2] has resulted in a large number of academically, albeit less "prominent", white papers, memoranda and reports [1, 3], which are guided by political agendas and also by economic necessities but which only rarely contribute to a discussion of concepts, spaces and methodologies or to a better understanding of the idea of "local retail supply". Expedient questions pointing beyond what is already known are still missing:

1. Is there in fact a problem with "local retail supply"? Who defines the problem's scope? What are residents demanding, how have their demands changed and are they in agreement with the objectives of socially responsible planning?
2. What is the basis of the concept of "proximity"? Is it based on biographical experience, on travelling distance, on the time it takes to travel that distance, on physical mobility, on mobility costs, on information (do I know all the stores), on discourses (who talks about it in what way?) or on convenience (is something absolutely or relatively close)? Is the closest store my favourite? Do I define local retail supply as the next best store? What kind of primary needs is this store required to meet? Does the concept of basic supply change over time with changing variety and quality standards? Does the concept of proximity vary in its particular meaning over space and time?

3. For whom is the concept of proximity (to one's house or workplace, etc.) relevant? For retail suppliers who use it to identify a secure customer base, for "vulnerable" customers in terms of age, gender, purchasing power and mobility or for policy makers and urban planners who are looking to ensure local quality of life? And who prevails in the local discourse, if anyone?
4. Which varieties of local retail supply already exist (petrol stations, convenience stores, garage stores, direct marketers, vending machines) and form centralities but are neglected in the role they play in planning and are often "overlooked" because only supermarkets and discounters are the accepted benchmark of "real" retail supply?
5. To what extent can "proximity" be isolated and defined in the here and now at all? To what extent is it a highly dynamic space-time construct anchored in the minds of individuals based on their life experiences, perceptions and individual capacity to process information? Shannon [4] rightly criticises that planning processes and GIS applications reduce undersupplied areas to "objective, calculable spaces" that are perceived neither as "sites of everyday practices" nor as relationally constructed spaces between perception, memory, imagination and learning.
6. Is an adequate local retail supply simply "de rigueur" today in a political climate in which ideals such as local ties, regional belonging and sustainable lifestyle are generally accepted elements of public discourse? Which "invisible" social contexts and actors are responsible for the crisis in local supply? And do they need more attention beyond the simple opening of an additional discount store [5]?
7. How could new theories and concepts be constructed in order to lend potential customers greater weight when it comes to evaluating customer needs and satisfaction and consequential decision-making processes as well as when searching for alternative (local) retail supply structures beyond traditional planning and supply-oriented discussions of centrality [6]?

In German-language scholarly literature concerned with local retail supply issues, all of these issues have only rarely been addressed [7, 8, 9]. If it is mentioned at all, the focus is on structural data, provided by retailers applying either a catalogue method or more extensive mapping, documenting gaps and, in extreme cases, the total disappearance of retail infrastructure altogether. The debate is dominated by traditional planning and policy models and the profit-maximising perspectives of real estate, project development and retail industries and by "steering" municipalities. The "solutions" include establishing "full-range retailers", special forms, e.g. mobile retail or "village shops" [10], the latter having received maximum political and media attention in the larger German federal states. Those solutions are seen as either an innovative concept for civic engagement or as a planning and marketing strategy for a multifunctional retail supply. Not least because of the methodological effort they entail, surveys of customers or local citizens remain the exception. The studies that have been conducted surprisingly reveal that a large share of customers is rather satisfied with the available local retail alternatives or define this satisfaction as a "multi-attributive construct" in urban-rural comparisons [11, 12].

3. Anglo-American and "critical" approaches

A significantly more critical and in many aspects dystopian tenor can be found in Anglo-American studies. They spatially correlate, analogous to urban (and socio-) geographic socio-ecological analyses, the thinning out of food retail supply and access to "healthy food" shopping baskets with social and demographic indicators. These studies are less concerned with why this thinning out is happening (*redlining* by large supermarket operators?) [13] but instead they elect to look at new residence pattern-based spatial discrimination of vulnerable population groups, i.e. the elderly, the immobile, persons of ethnicity or the poor [14]. These discrimination patterns for one are interpreted as a result of these groups needing to comparatively invest more time and have higher expenses for procuring food or on the other hand are attributed to so-called "unhealthy foods" that are increasingly purchased when alternatives disappear [15, 16]. Various concepts such as *food deprivation, food poverty* and *food deserts* have been applied to underline metaphorically the thesis that (the lack of) variety and quality of retail food supply both reflects and consolidates spatial structures of *poverty* and *social exclusion* [17]. In the last fifteen years they have resonated both in scholarship and politics, especially in the context of major social and ethnic contrasts in North American and British cities. There spatial anomalies in public health, e.g. the occurrence of diabetes or obesity, are associated with the lack or scarcity of "positive" retail structures and they are countered through urban planning measures - most often by establishing super- and hypermarket infrastructures. More so in the UK than in the United States, these spatial analyses are associated not only with the discipline of geography but also with public health [18]. Geographers have completed GIS-based analyses to reveal different correlation scales between supply structures and *demographic blight* in urban or rural environments, backing these with visually provocative maps [19, 20].

That said, more recent works in the tradition of "critical" scholarship [21] contradict "naive" claims on the calculability of *food deserts* or *food deprivation areas* via GIS and thereof resulting stigmatisation of people and spaces outside the "reasonable" catchment area of a given supermarket. These are their core theses:

1. "Critical" scholarship criticises the supply-focused *built-environment thesis*, which assumes that if there is a supply, the population will use it ("if you build it, they will come - if you

build it, they will eat better"(?) [22]. Claiming a compelling correlation between *food access* and *food intake* requires the "analyses of lived behaviour" based on case studies [23] but which to our knowledge have yet to be conducted.

2. They further argue that policy-makers and at times scholars are prone to a "single optimised rationality" [4], i.e. they see the competence for realising a satisfactory product range solely in full-range retailers, causing them to ignore or not pursue alternative retail supply models [24]. The result is a standardisation of food culture and the conclusion that quality of life depends solely on the distance to the nearest supermarket.

3. Also they criticise that many arguments are based on data that is too general in nature (i.e. censuses), e.g. that food deserts are contiguous spatial islands, whose existence is in turn solely a factor of accessibility. Shaw [25] distinguishes ability, assets and attitude as the main problems underpinning the concept of accessibility. Based on how these are weighted in relation to factors such as age, gender, mobility or purchasing power, a variety of overlapping 'objective' or perceived food desert-types emerge.

4. Another argument is that the discussion about retail supply shortages is mainly based on "objective", measurable and rational criteria such as distance, time, price or cost and that the emotional side, which can only be identified via qualitative studies, e.g. "fear and anxiety about being food insecure in the future", is ignored [26].

5. Finally, they criticise that "many community food insecurity situations are not caused only by local level factors, and that they therefore cannot be completely solved locally. Localism can also reduce peoples' lens of care, pit communities against each other and allow local victories to bring about complacency" [27, p. 18]. Multiscale approaches are needed to understand the effects of the hierarchies, priorities and power structures of policy, capital and (outside) elites on food security, localities and actors, extending beyond the *growth coalitions* of local politicians, planners and investors coming together as *spatial engineers* [4] to improve food security. On the one hand, the latter often do not meet the more complex needs of potential customers (beyond proximity and price) [28, 29] but often inadvertently push local specialty stores out of the market. On the other hand, they increasingly even encounter local resistance with the local community summoning its governance potential to protest local retail monopolies [30], which they often identify with a reduction in quality of life.

4. Concepts of food deserts

The scientific discussion on food (supply) covers a wide range of disciplines in which foods are examined as economic goods, as political resources or as cultural commodities. They look at food from both natural and social science perspectives, the prerequisites and consequences of food production and the nature of individual food products. Food is ever-present in popular discourses, e.g. in cookbooks, TV cooking shows, in menus, taste tests and advertising. It is part of discussions on consumer protection, waste, food as an event, meals on wheels and food as pleasure. Since the 1970s, food production has also been discussed in connection with the global limits of growth, especially in terms of *food security*, which is broadly defined as "all people, at all times, hav[ing] physical, economic and social access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" [31, p. 92]. This definition stresses that the problem of *food poverty* or *food insecurity* is not only connected to the relatively anonymous production and supply of food on the macro level but also to access and individualised needs on the micro level [32].

However, today sustainable access to adequate food can no longer be taken for granted, even in the global north. Rising costs for rent and utilities result in shrinking disposable incomes, and the social and spatial marginalisation of various population groups have led to increasing numbers of households being exposed to both material and social food poverty ("obtain [ing] food in ways which are dignified and in keeping with social norms") [33, p. 45]. This type of food poverty in the global north is usually not equated with an existential struggle for survival but with a monotonous diet, more expensive food, more time-consuming food procurement due to longer distances to shopping opportunities and "forced coping strategies" for "procuring" food [34], limited range of food choices and in turn even fewer opportunities for "social participation through food" [34]. And even in cases where food security is assumed, the situation is often precarious due to entrepreneurial freedom of action and volatile civic engagement, so that once adequately supplied areas, as a result of capital interests, can quickly turn into a real or perceived food desert. A postmodern interpretation of food security thus aims to a) do justice to the complexity and uncertainty of both food procurement strategies as well as to the social environment; b) not look for "solutions" in top-down but more in bottom-up strategies that focus on self-determination, "adequate plurality" and "self-targeting, in which people themselves select which interventions most suit them at a particular time" and "greater individual commitment" [32]; c) look at the "enabling state" as one that promotes via standards, guidelines and laws the establishment of governance structures that allow for the negotiation of food security and local supply.

This is where the concept of food deserts, its structures, explanatory potential, shortcomings and its transferability to the German context enters the discussion. There is a broad range of definitions [35] revealing that "food desert" is a "spatial-structural discrimination" construct (ibid, 9) based on normative, "reasonable" catchment areas (in

km), but are largely not reflected when describing food in terms of "adequacy", "quality", "health" and "affordability". Shannon [4] sees a fundamental problem in geographical studies on this issue, especially concerning the definition's second part. These studies very often consider "stores as proxies for the food that they carry, endorsing large supermarkets as the best solution to poor food access" [4]. It is assumed that the diversity of products inherent to larger supermarkets is the best solution in times of declining numbers of small retailers. This fact is considered socio-financially acceptable and as "sufficient" in terms of quality, freshness etc. ("normalizing [supermarkets] as a model of a healthy food system implicitly sanctions the policies and processes that led to their creation"; [4, p. 258]). Contradictory to this, standardised procurement and eating habits may also stigmatise deviating body forms as politically and economically unproductive. Studies verify these body forms as the visible expression of undisciplined lifestyles and indicators of food deserts [4].

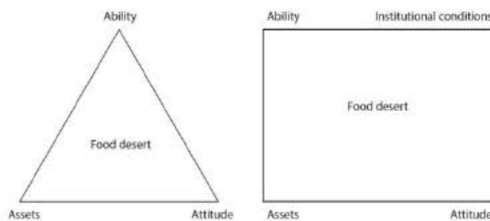

Fig 1. Modelling food deserts [25, 36]

The discussion about food deserts is thus, for one, one of accessibility, health, diversity of produce and freedom of choice between different providers, and, for another, it is one of "power, control and inequality", i.e. in regards to the construction of space, coalitions of interest, financial interests and social ideals on different spatial levels that dominate the development and the social discourse on retail food structures [37]. While the first aspect mainly focuses on the reacting demand side and its actions, social preconditions, perceptions and adaptation to "prescribed" supply patterns, the second aspect reflects the institutional environment and economic considerations that "make" food deserts: "Who can force a business to stay in a location that is not profitable"? [27]. Concluding from the above mentioned, the following questions can be brought forward: a) how are food deserts identified and how can they be weighted and measured in terms of causes and indicators for different individual and household types; b) who among the variety of relevant actors is "responsible" for the development of food deserts (both in virtual and non-virtual space); c) which actors identify food deserts as a problem as such, who defines and discusses them in the media (and has the power and legitimacy to do so); d) what solutions can be found in the for profit and non-profit sectors and what knowledge can be transferred from similar situations elsewhere; e) how might objective and subjective, absolute and relative standards be used to describe food deserts not as ghetto-like spatial islands but as individual and unique areas of undersupply that can be changed (biographically and through learning). The goal is thus to free the concept of food deserts from a (static) demand side analysis and their stigmatisation as a "local trap" [38] and understand the complexity of "neighbourhood food environments" [38, p. 1421] beyond the predominant (descriptive) supply structures.

5. Re-conceptualisation of food deserts

In the following, a new concept of food deserts is presented. Complementing the considerations of previous authors, Figure 2 describes food deserts in contrast to its more static predecessors (Figure 1):

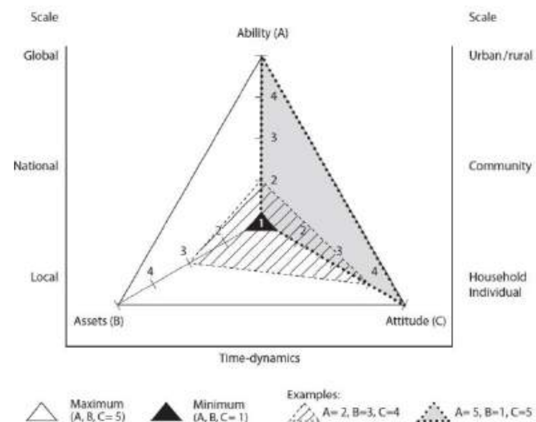

Fig 2. Extended model for food deserts (Source: Author)

A. as a temporally dynamic, spatially and ideally changeable construct for consumers. The dynamic is such that it varies continuously on the tripartite system of **accessibility criteria** ("ability - assets - attitude" [25] or "informational access - economic access - geographic access" [19]) that define the totality of food access. Changes in perceptions and information, changes in economic resources (i.e. greater purchasing power or the availability of a car), changes in spatial criteria and experience (i.e. new roads; new products) and **changes in the weighting** of the three accessibility criteria (i.e. due to demographic change) can in turn change the triangle, which represents the relative food desert in its area, making it take on very different shapes and sizes, even reducing it to a line or point (i.e. no food desert can be identified) [25, p. 244f]. Comparisons of households and individuals and the superimposition of such individual accessibility triangles can define the core economic, social and spatial extent of a food desert. The individually perceived variants necessarily extend over the edges of this core area in places.

B. as a concept that makes it possible to identify on the basis of their **deviation** outside of the core triangle the groups, household structures or other social and demographic peculiarities that need to be considered as minorities that experience their own food deserts outside of the general norm.

C. as a concept that needs to be discussed on **different spatial scales**. Food deserts do not need to only to be understood as local spatial and perceptive islands but as structurally embedded in

institutional conditions on the "national" or "global" level (spatial planning considerations, location decisions by retail food corporation, disposable income developments on the macro level, quality of life discourse).

Fig 3. The return to micro shops? (Source: Author)

D. as a concept that needs to be discussed on **different social scales** when searching for local solutions. This concept allows to include both the micro level, i.e. the experiences of households and individuals, and the meso and macro levels of governance discourse (communities or municipalities), i.e. political parties, local elites, citizens' groups.

E. The **temporal variation** of the three accessibility criteria is therefore on the one hand a function of (generally long time) biographical changes and learning processes and adaptation on the micro level and on the other hand a function of (generally short term) changeable conditions and discourses on the meso and macro levels.

6. Conclusion

a) The understanding of supply gaps **varies** over time (closed on Wednesdays, open only in the morning hours, open seasonally), space, actor groups and motivation such as satisfaction, convenience, planning models or sales figures. However, the often static concept of food deserts is concentrated on demand alone and defined in terms of *ability* (mobility, accessibility, cooking skills), *assets* (purchasing power, cars) and *attitude* (learning, information, lifestyle).

b) The development or perception of retail supply shortages occurs on multiple **dynamic levels**, i.e. (1) via the objective, mappable thinning of retail infrastructure over time; (2) via changing perceptions of supply deficits as seen on the demand side in the here and now by different (groups of) individuals of variable mobility, social stratification etc.; (3) via changing perceptions of supply deficits by one and the same person owed to biographical changes, learning processes, experiences and expectations; (4) via the changing social acceptance of individual (full-range) retail forms as local food suppliers; and (5) via planning models that debate full-range supply, perforated supply and complete retreat from the market. Only dynamic or at least comparative-static considerations make it possible to discuss supply gaps adequately [15, 22].

c) There is no such thing as a closed supply desert, only **mosaic-like spaces** where disadvantaged groups live and in which "no supply" is based only on the fact that a theoretical ideal of vicinity is not realised or other alternatives appear out of reach. The question arises, how these disadvantaged groups are able to express themselves, whether they are heard and which solutions policy-makers or planners present or whether they themselves create self-help projects.

Fig 4. Searching for food deserts beyond island structures generated through GIS network analysis (Source: Author and cartography by Johst)

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References

1. BMVBS, (2013). *Nahversorgung in ländlichen Räumen*. Berlin: BMVBS.
2. Jürgens, U. (ed.), (2014). *Entwicklungen und Perspektiven von Nahversorgung im Lebensmitteleinzelhandel.* Kiel: Universität Kiel.
3. Bayerisches Staatsministerium für Wirtschaft und Medien, Energie und Technologie, (2013). *Der Dorfladen in Bayern.* München: Bayerische Landesregierung.
4. Shannon, J., (2014). Food deserts: governing obesity in the neoliberal city. *Progress in Human Geography,* 38*(2):* p. 248-266.
5. Bedore, A., (2013). Geographies of capital formation and rescaling: a historical-geographical approach to the food desert problem. *Canadian Geographer,* 57(2): p. 133-153.
6. Heynen, N.; Kurtz, H., & Trauger, A., (2012). Food justice, hunger and the city. *Geography Compass,* 6(5): p. 304-311.
7. Institut für Entwicklungsforschung im Ländlichen Raum Ober- und Mittelfrankens e. V. (ed.), (1996). *Versorgung im ländlichen Raum – Probleme des Einzelhandels im dörflichen Umfeld*. Kronach: Selbstverlag.
8. Schnedlitz, P.; Kotzab, H., & Cerha, C., (2000). Betriebstypenspezifische Einkaufsstättenwahl und Nahversorgungsproblematik. *In: Tromms-*

dorff, V. (ed.): Handelsforschung 1999/2000. Wiesbaden: Gabler*:* p. 195-212.

9. Steinröx, M., (2013). Ländlicher Raum bald ohne Nahversorgung? *Neues Archiv für Niedersachsen,* (2): p. 108-120.
10. Hahne, U., (2009). Zukunftskonzepte für schrumpfende ländliche Räume. *Neues Archiv für Niedersachsen,* (1): p. 2-25.
11. Meixner, O. et al, (2007). Nahversorgung im ländlichen Raum – eine entscheidungsorientierte Analyse mittels des Analytischen Hierarchieprozesses. *Die Bodenkultur,* 58(1-4): p. 25-38.
12. Ellger, C., (2000). *Dienstleistungen im ländlichen Raum.* Berlin: FU Berlin.
13. Eisenhauer, E., (2001). In poor health: supermarket redlining and urban nutrition. *GeoJournal,* 53: p.125-133.
14. Vias, A., (2004). Bigger stores, more stores, or no stores: paths of retail restructuring in rural America. *Journal of Rural Studies,* 20: p. 303-318.
15. Wrigley, N., (2002). ´Food deserts´ in British cities: policy context and research priorities. *Urban Studies,* 39(11): p. 2029-2040.
16. Whelan, A. et al, (2002). Life in a ´food desert`. *Urban Studies,* 39(11): p. 2083-2100.
17. Gordon, C. et al, (2011). Measuring food deserts in New York City´s low-income neighbourhoods. *Health & Place*, 17: p. 696-700.
18. Cannuscio, C.; Hillier, A.; Karpyn, A., & Glanz, K. (2014). The social dynamics of healthy food shopping and store choice in an urban environment. *Social Science & Medicine*, 122: p. 13-20.
19. McEntee, J., & Agyeman, J., (2010). Towards the development of a GIS method for identifying rural food deserts. *Applied Geography*, 30: p. 165-176.
20. Russell, S., & Heidkamp, P., (2011). `Food desertification`: the loss of a major supermarket in New Haven, Connecticut. *Applied Geography,* 31: p.1197-1209.
21. Brenner, N., (2009). What is critical urban theory? *City,* 13(2/3): p. 198-207.
22. Donald, B., (2013). Food retail and access after the crash: rethinking the food desert problem. *Journal of Economic Geography,* 13: p. 231-237.
23. Alkon, A. et al, (2013). Foodways of the urban poor. *Geoforum,*48: p. 126-135.
24. McEntee, J., (2009). Highlighting food inadequacies: does the food desert metaphor help this cause? *British Food Journal*, 111(4): p. 349-363.
25. Shaw, H., (2006). Food deserts: towards the development of a classification. *Geografiska Annaler,* 88(2): p. 231-247.
26. Kneafsey, M. et al, (2013). Consumers and food security: uncertain or empowered? *Journal of Rural Studies,* 29: p. 101-112.
27. Bedore, M., (2007). *Market failure, government failure: learning from Kingston´s ´food desert´ to plan for a just city* [Online], Available: http://sites.utoronto.ca/isrn/publications/-WorkingPapers/Working07/Bedore07_Mar-ketFailure.pdf [13 Sept 2014].
28. Hare, C.; Kirk, D., & Lang, T., (1999). Identifying the expectations of older food consumers – more than a "shopping list" of wants. *Journal of Marketing Practice – Applied Marketing Science,* 5(6-8): p. 213-232.
29. Woodliffe, L., (2004). Rethinking consumer disadvantage: the importance of qualitative research. *International Journal of Retail & Distribution Management,* 32(11),: p. 523-531.
30. Jürgens, U., (2012). Governance and new discounter outlets in Germany. *Erdkunde,* 66(2): p. 109-119.
31. Riches, G., (2002). Food banks and food security. *Social Policy and Administration,* 36(6): p. 648-663.
32. Maxwell, S., (1996). Food security: a post-modern perspective. *Food Policy,* 21(2): p. 155-170.
33. Dowler, E., & O´Connor, D., (2012). Rights-based approaches to addressing food poverty and food insecurity in Ireland and UK. *Social Science & Medicine*, 74: p. 44-51.
34. Pfeiffer, S., (2009). *Hunger in der Überflussgesellschaft,* [Online], Availaible: http://www.sa-bine-pfeiffer.de/files/downloads/Pfeiffer-Hunger-Ueberflussgesellschaft.pdf [13 Sept 2014].
35. Augustin, H., (2014*). Stadt, Ernährung und soziale Ungleichheit – Zur Übertragbarkeit des food desert-Konzeptes auf den deutschen Kontext.* Bremen: artec (=artec-paper 197).
36. Sperk, C. & T. Kistemann, (2012): Food desert oder gesunde Stadt? Eine Untersuchung von Nahrungslandschaften in Bonn. *Berichte zur deutschen Landeskunde,* 86 (2): p. 135-151.
37. Block, D. et al, (2012). Food souvereignty, urban food access, and food activism: contemplating the connections through examples from Chicago. *Agriculture and Human Values*, 29: p. 203-215.
38. Bedore, A., (2010). Just urban food systems: a new direction for food access and urban social justice. *Geography Compass,* 49: p. 1418-1432.